

NOAA Technical Memorandum NMFS



MARCH 2008

REPORT OF A HYDROGRAPHIC SURVEY OF CLIPPERTON RIDGE CONDUCTED ABOARD THE *DAVID STARR JORDAN* DURING THE *STENELLA* ABUNDANCE RESEARCH CRUISE 2006

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NOAA-TM-NMFS-SWFSC-419

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REPORT OF A HYDROGRAPHIC SURVEY OF CLIPPERTON RIDGE CONDUCTED ABOARD THE *DAVID STARR JORDAN* DURING THE *STENELLA* ABUNDANCE RESEARCH CRUISE 2006

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Introduction and methods

The National Oceanic and Atmospheric Administration (NOAA) Research Vessel DAVID STARR JORDAN (hereafter, JORDAN) based in San Diego, CA, supports the research efforts of the NOAA Southwest Fisheries Science Center (SWFSC). General operational capabilities include fisheries stock assessment (trawl and long line operations), physical and biological oceanography, and marine mammal abundance research. Although hydrographic data acquisition is not a primary mission of the ship, the JORDAN is equipped with several acoustic echo sounding systems including the Simrad EK500 (200 kHz, 1200 kHz, and 38 kHz transducers), Simrad ES60 (50 kHz), Skipper GDS101 Navigational fathometer (200 kHz) and Knudsen 320B (12 kHz).

The JORDAN collected reconnaissance bathymetric data while operating near Clipperton Island from 9-11 November 2006. Sea floor depth data were collected along Clipperton Ridge using a Knudsen 12 kHz echo sounder. Position and ship track data were simultaneously monitored and saved using Nobeltec Navigation Suite version 7. Acoustic backscatter data to a depth of 500m were recorded using a Simrad EK500 echosounder and associated software. These hydrographic data were collected by the Oceanographer and Officers while underway on research cruise DS-06-05, STAR (Stenella Abundance Research); a triennial marine mammal and ecosystem survey (<http://swfsc.noaa.gov/prd-star.aspx>).

The JORDAN approached Clipperton Island from the east on an average course of 267° T and collected hydrographic data from 21:30 local mean time (LMT) on 9 November 2006 (+6 GMT) until 08:10 LMT on 10 November 2006. Additional data were collected north and west of Clipperton Island from 19:00 LMT on 10 November 2006 until 02:00 LMT on 11 November 2006. The Knudsen system was used for this survey because it is the only echosounder on board capable of detecting the sea floor at depths greater than 1200m. The JORDAN was not equipped to record the digital data of this trace, hence screen shots are provided. EK500 data was recorded during the entire survey and may be of particular interest for the period between 08:07 to 19:02 LMT on 10 November 2006. During this time frame the Knudsen echosounder was not recorded as the JORDAN was on standby, awaiting the completion of scientific activities on Clipperton Island.

Results

Ship positions and bathymetric data collected along Clipperton Ridge to the east of Clipperton Atoll are presented in Figures 1 – 11 and Table 1, and to the north-northeast of Clipperton Atoll in Figures 12 – 16 and Table 1.

The ship transited repeatedly along the north side of Clipperton Atoll between 08:07 and 19:02 LMT on 10 November 2006 (figure 17). During this time, bathymetric data were collected using a Simrad EK500 echosounder. These data are available by contacting Lisa.Ballance@noaa.gov.

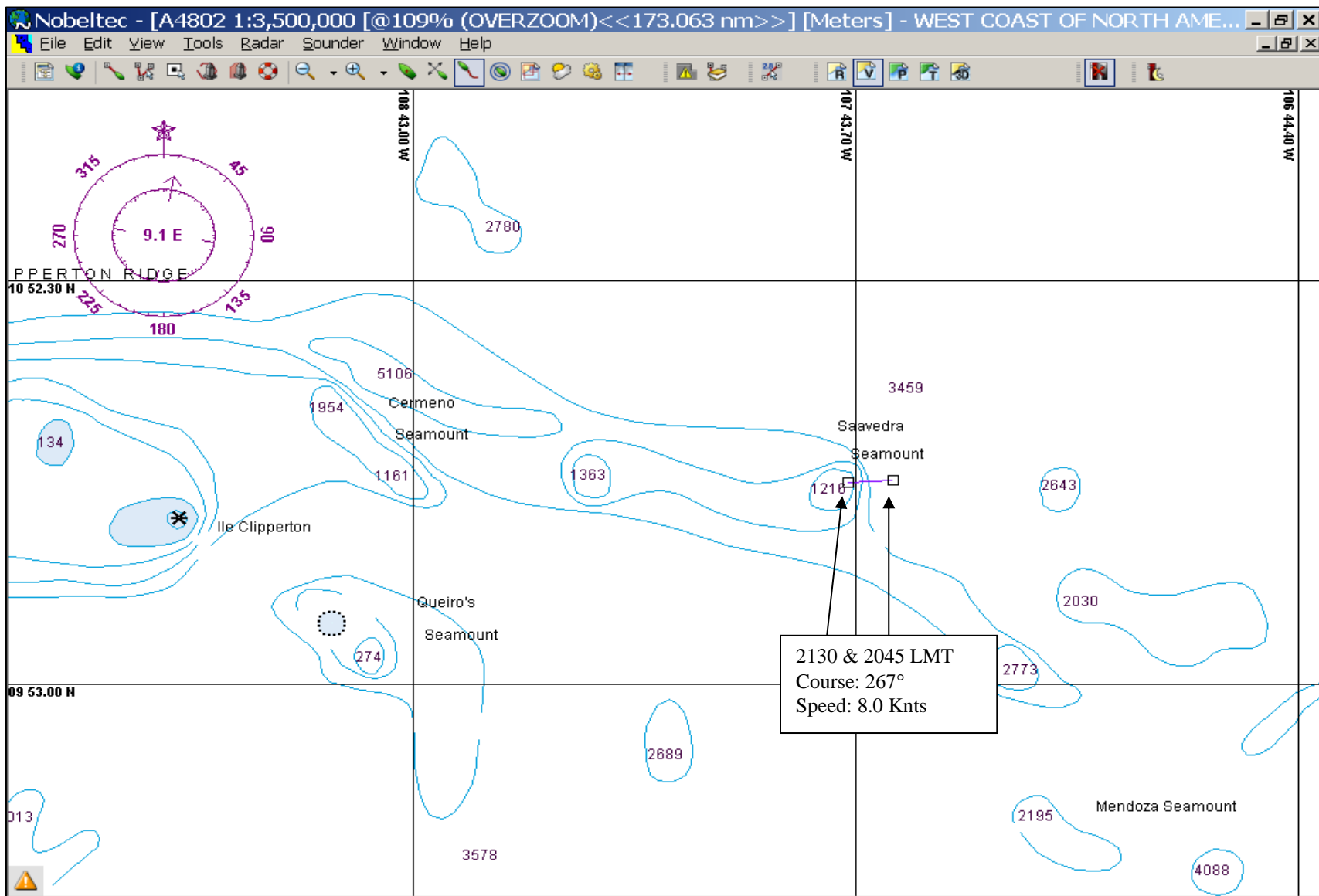


Figure 1a: Ship's position at 20:45 and 21:30 local mean time (LMT) on 9 November, 2006. Corresponding hydrographic data are given in Figure 1b. Depth contours are in meters.

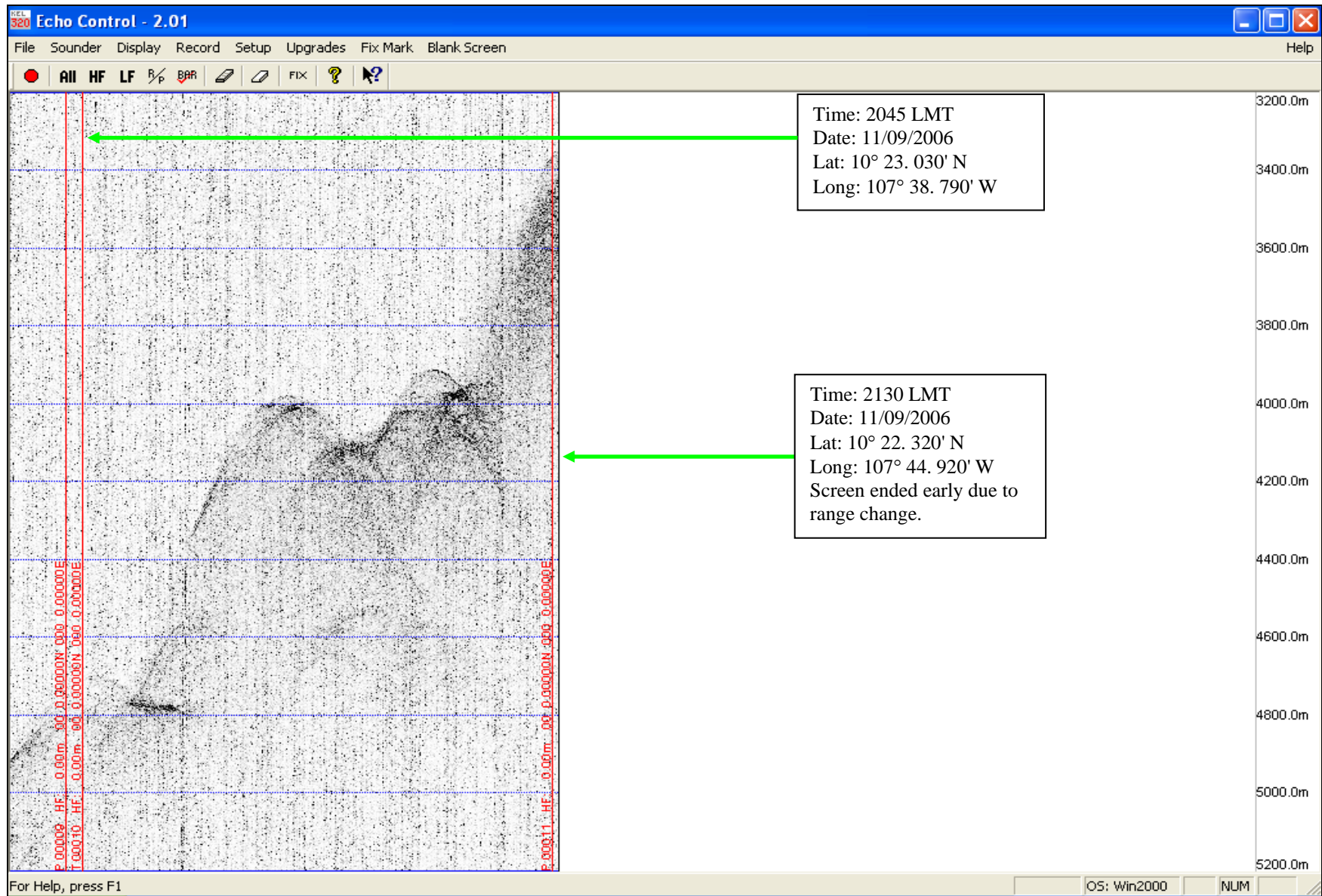


Figure 1b: Bathymetric profile corresponding to ship's location in Figure 1a.

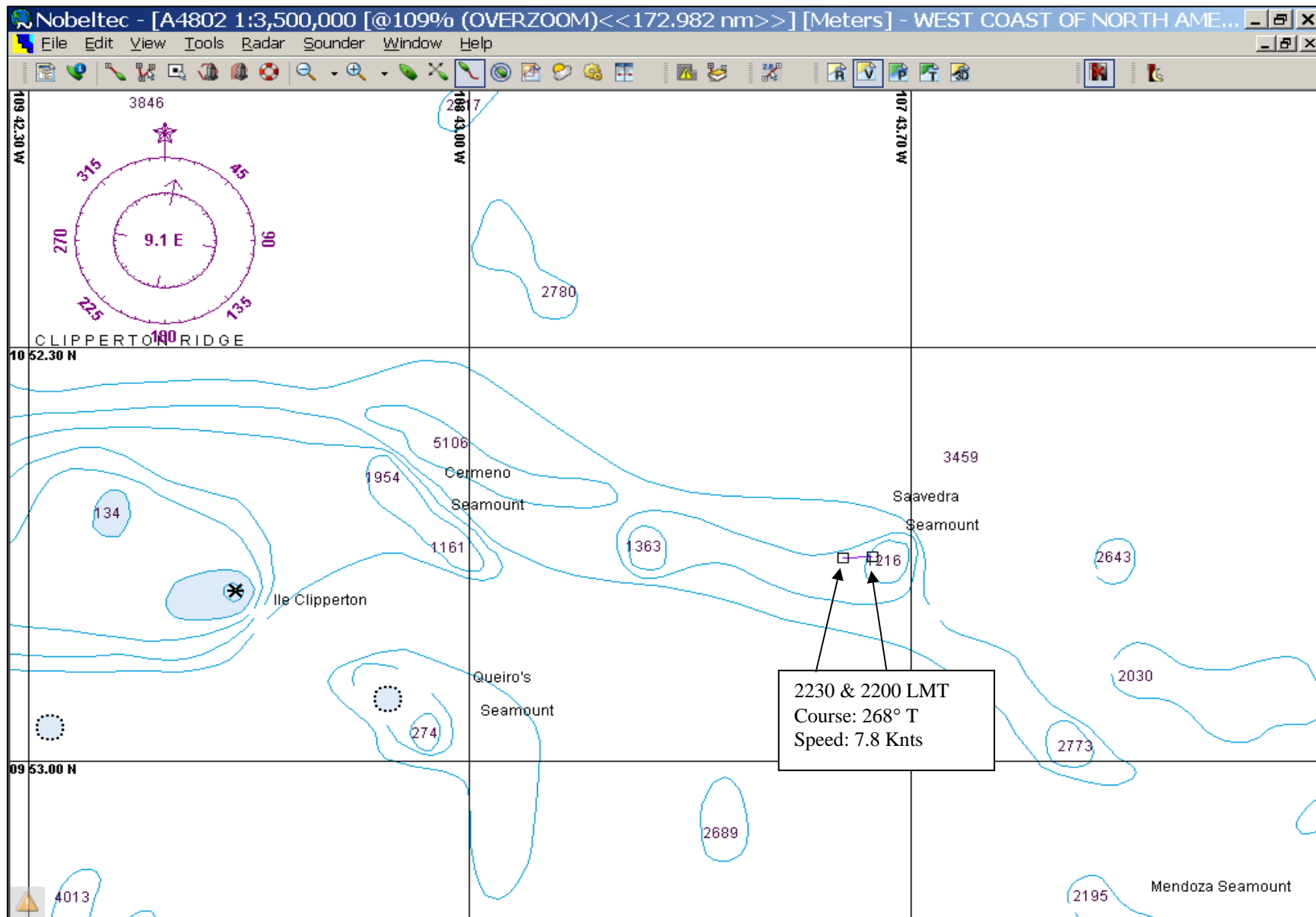


Figure 2a: Ship's position at 22:00 and 22:30 LMT on 9 November, 2006. Corresponding hydrographic data are given in Figure 2b. Depth contours are in meters.

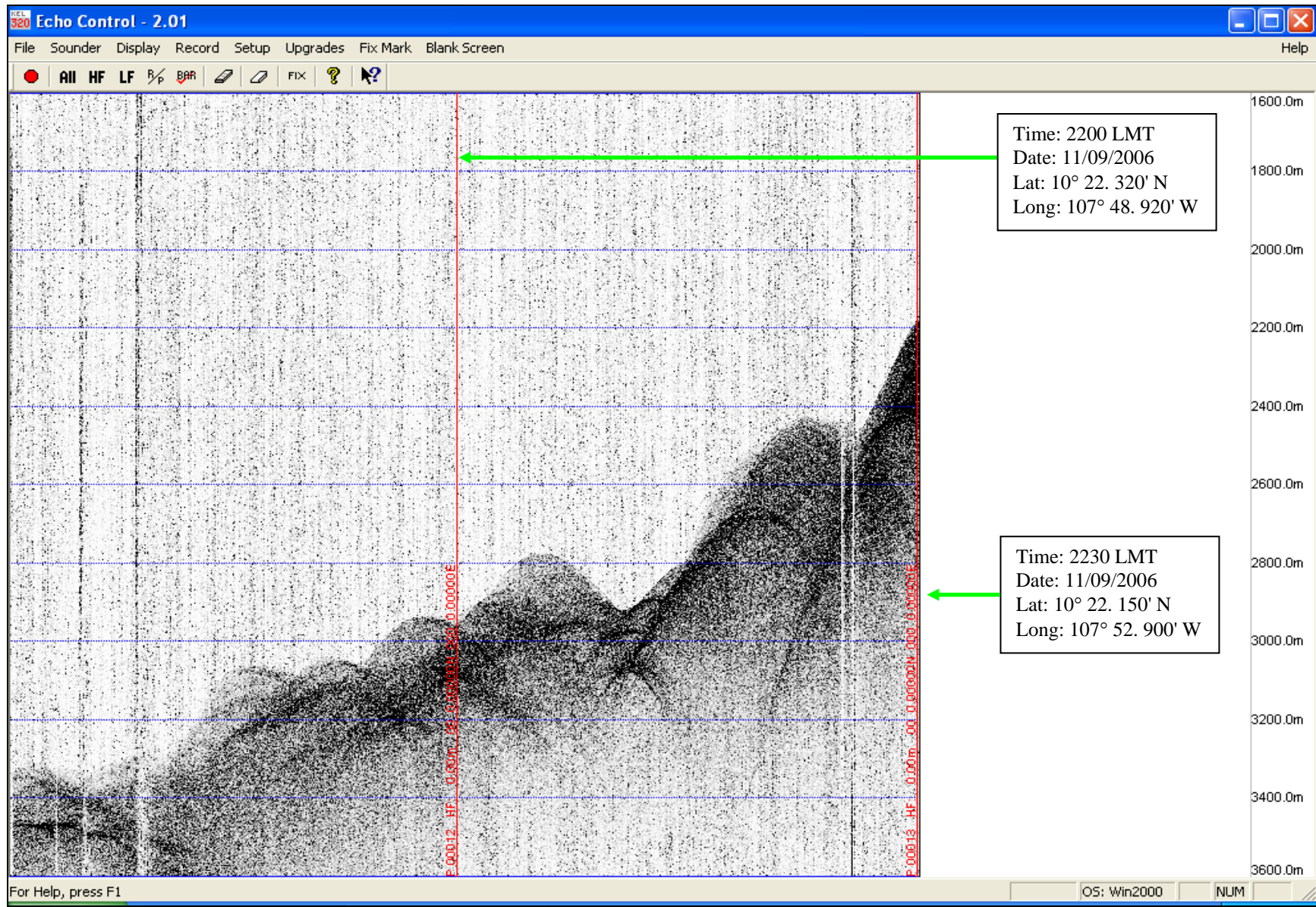


Figure 2b: Bathymetric profile corresponding to ship's location in Figure 2a.

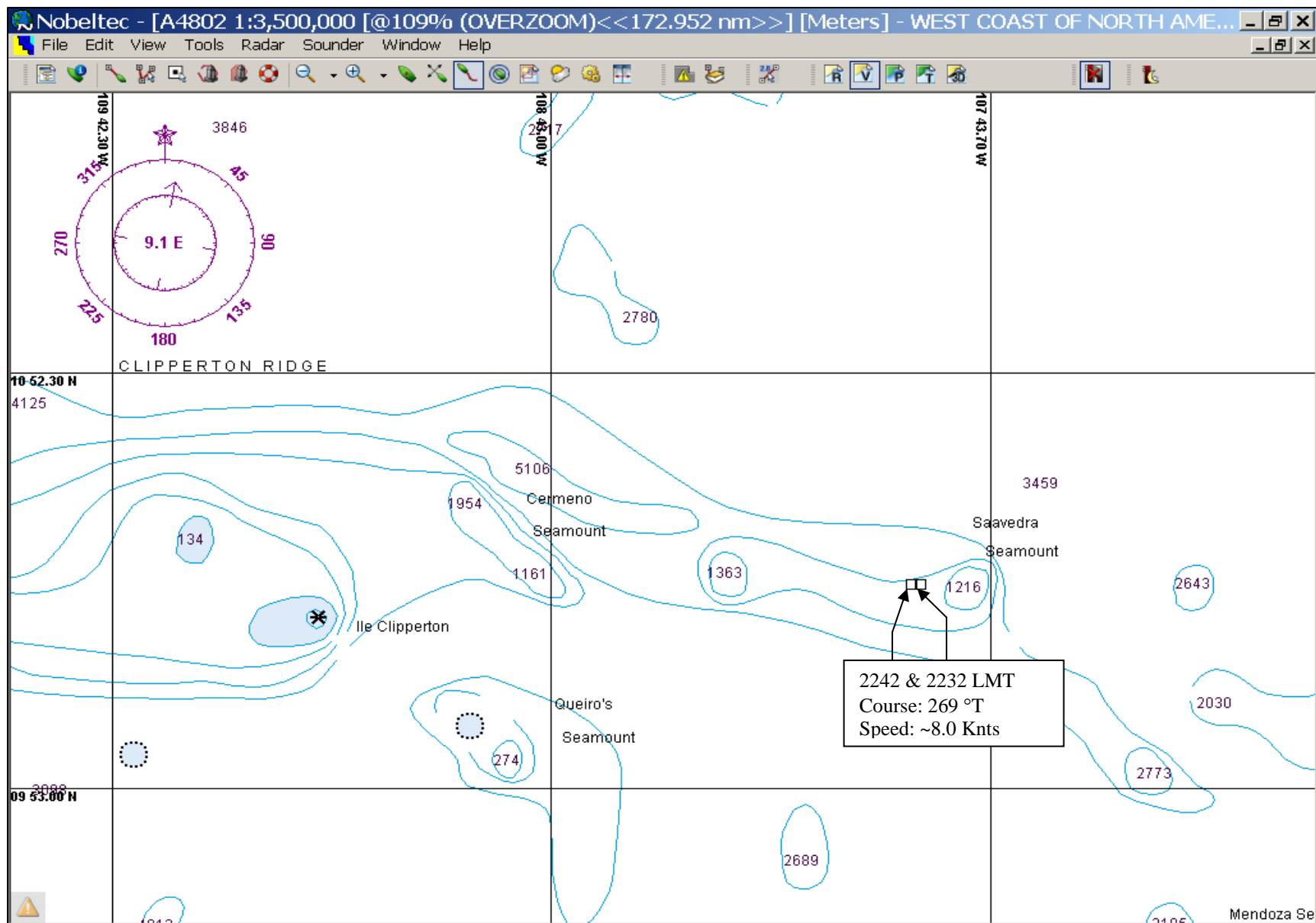


Figure 3a: Ship's position at 22:32 and 22:42 LMT on 9 November, 2006. Corresponding hydrographic data are given in Figure 3b. Depth contours are in meters.

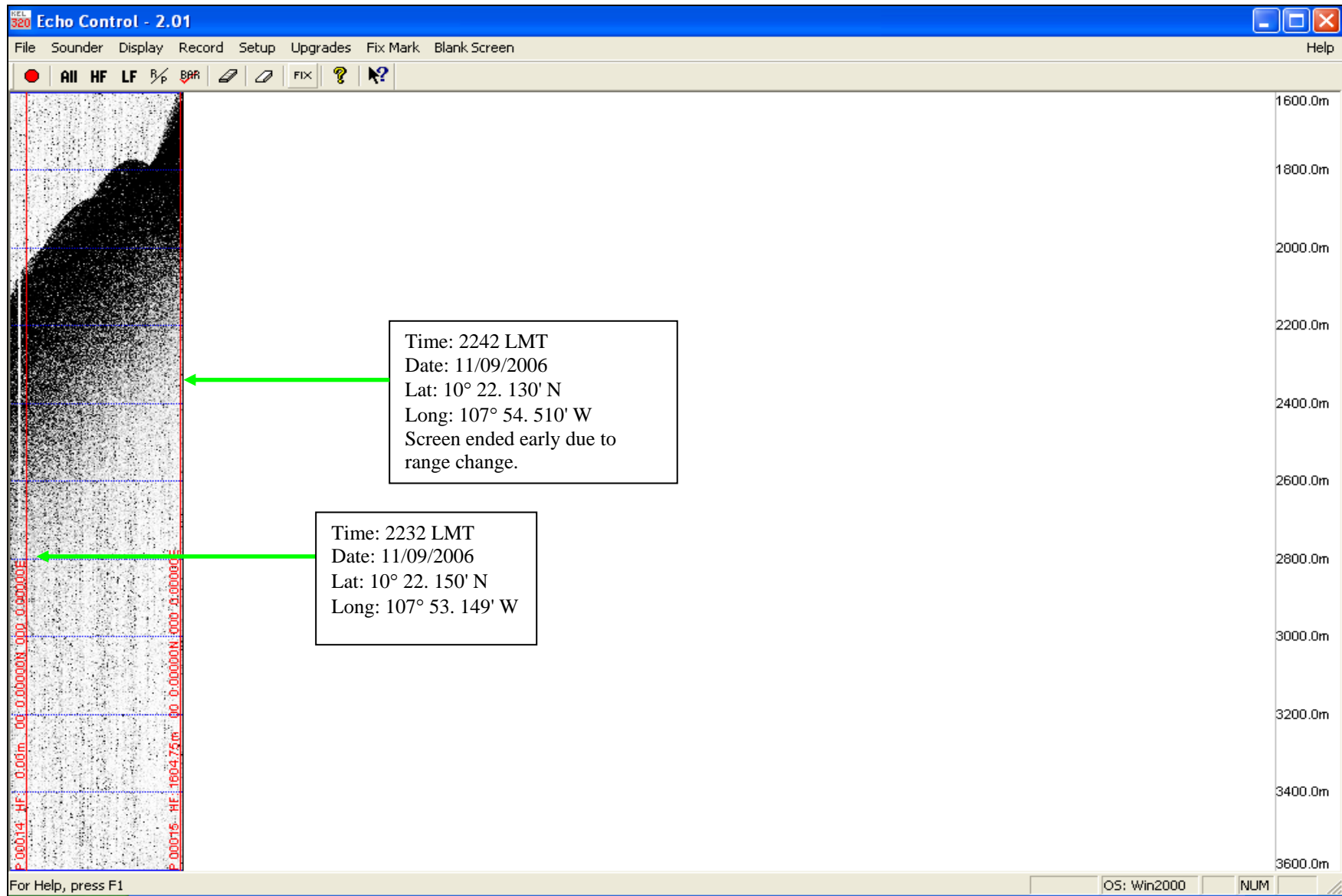


Figure 3b: Bathymetric profile corresponding to ship's location in Figure 3a.

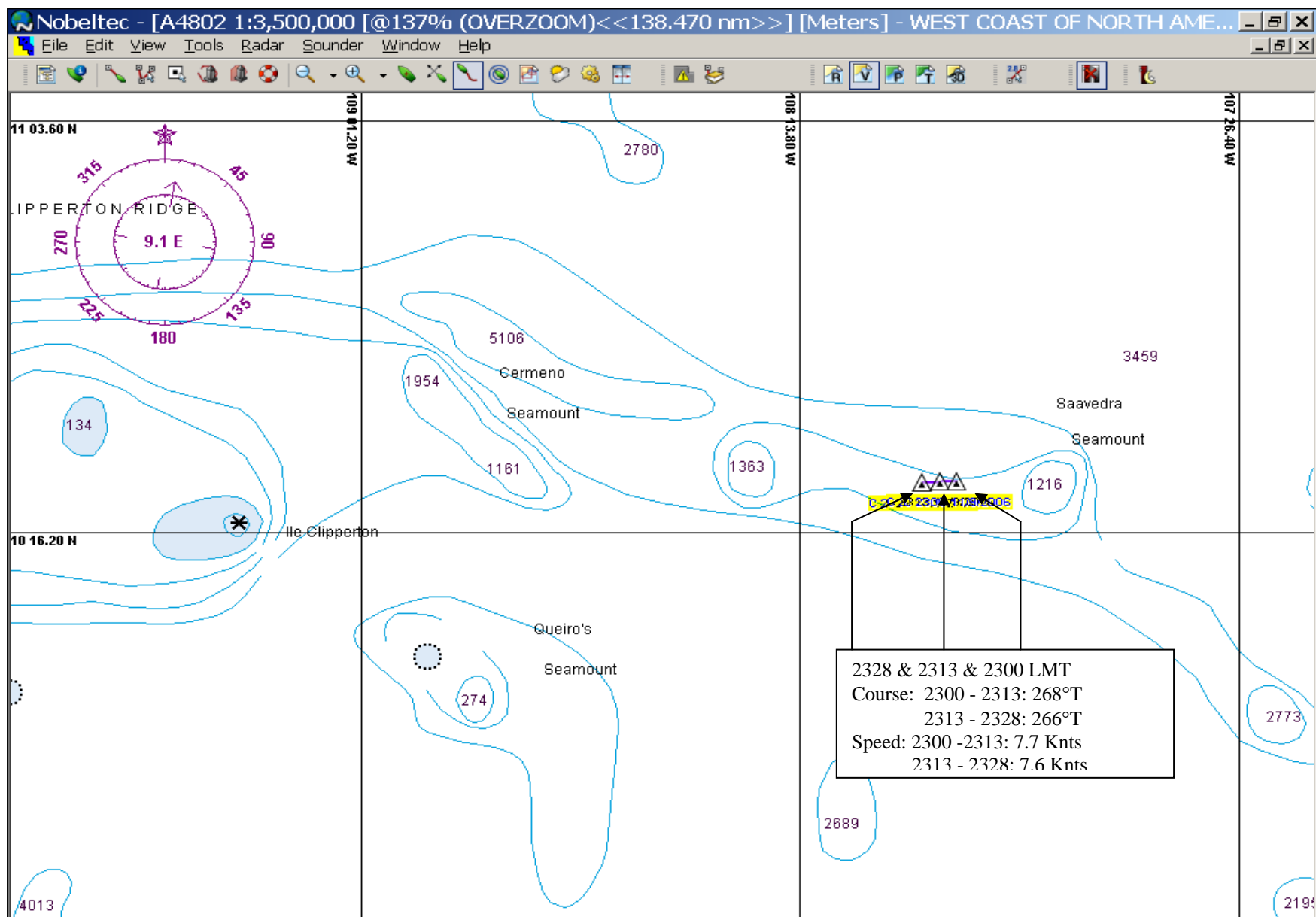


Figure 4a: Ship's position at 23:00, 23:13 and 23:28 LMT on 9 November, 2006. Corresponding hydrographic data are given in Figure 4b. Depth contours are in meters.

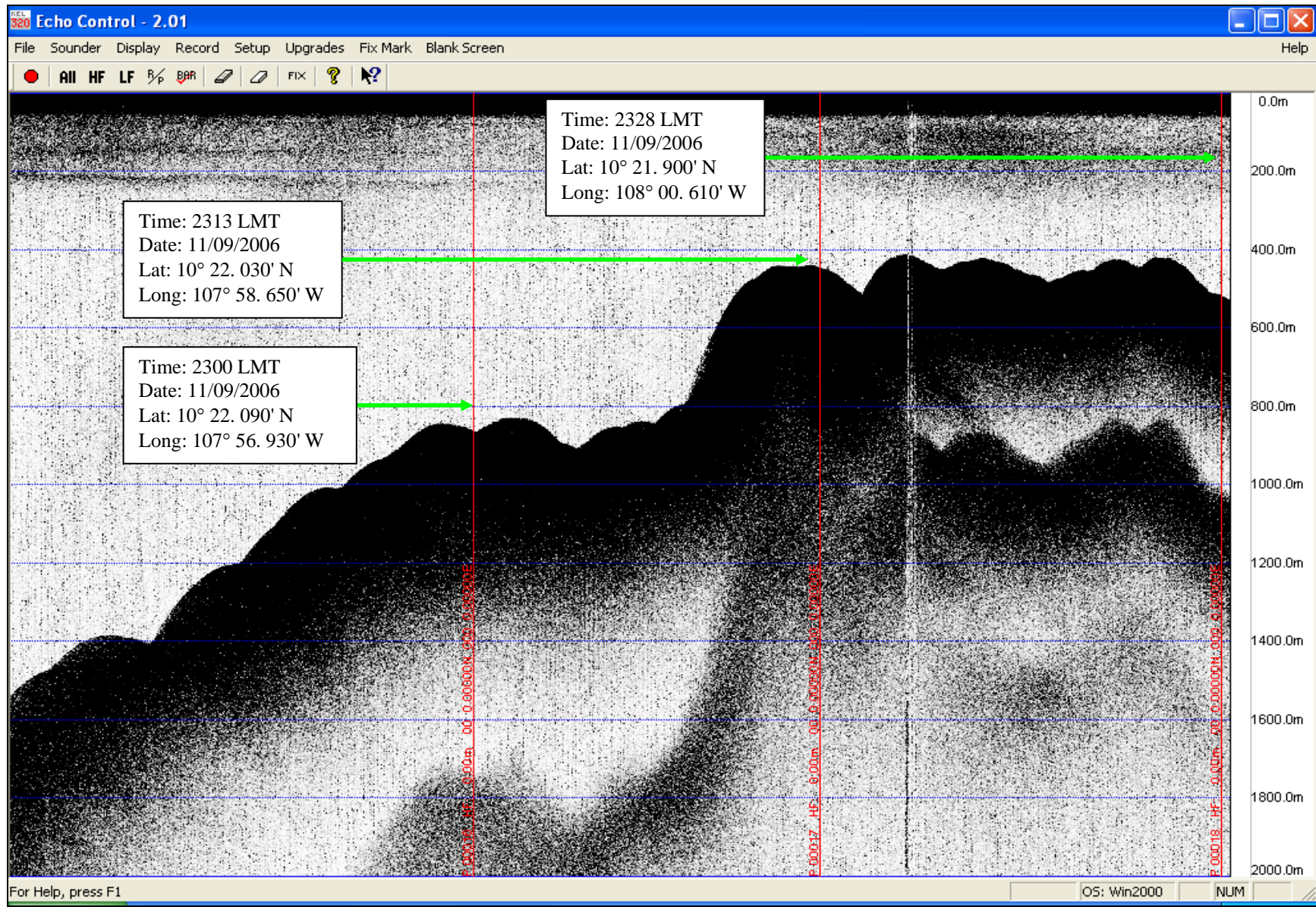


Figure 4b: Bathymetric profile corresponding to ship's location in Figure 4a.

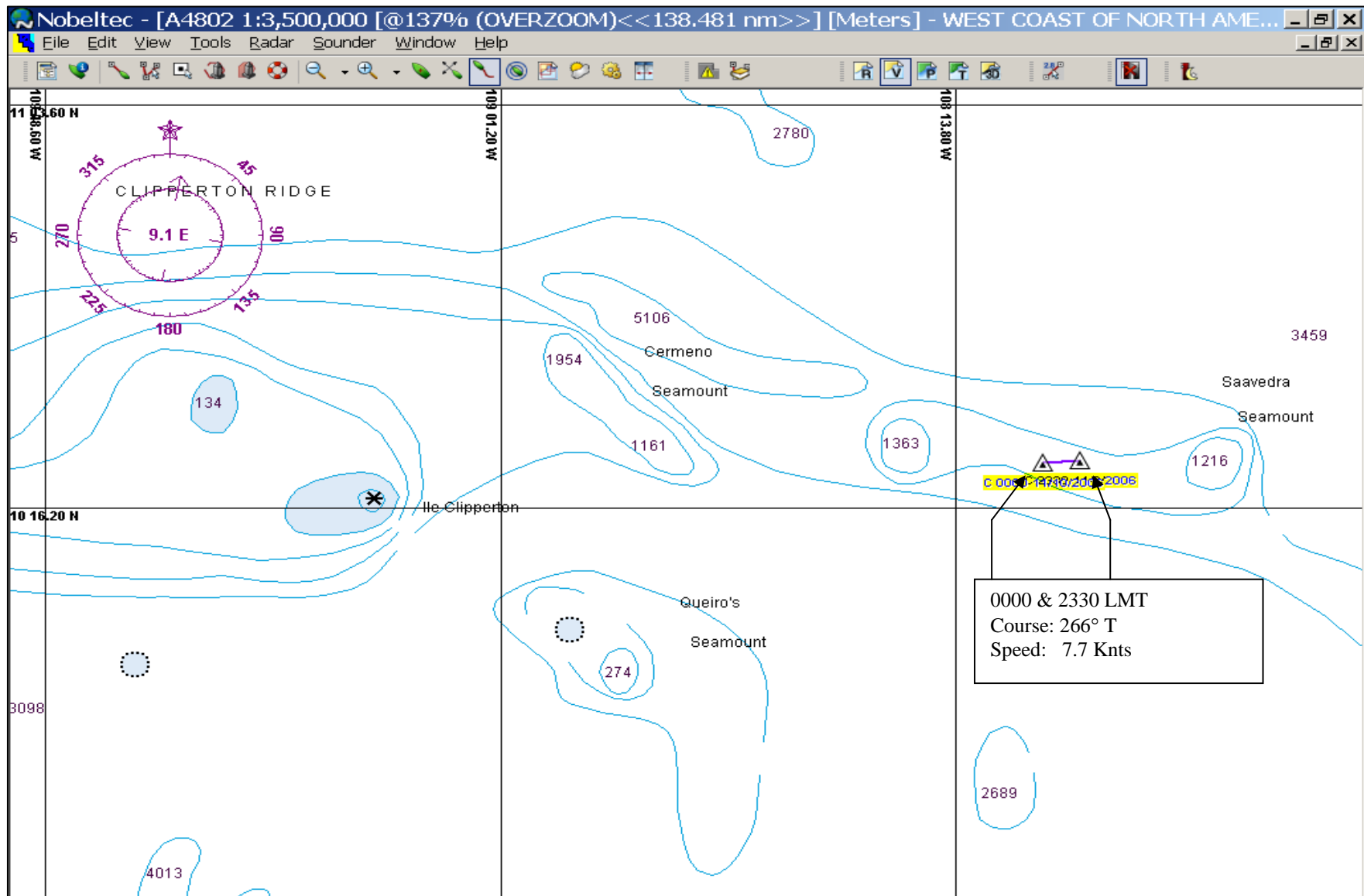


Figure 5a: Ship's position at 23:30 and 00:00 LMT on 9 and 10 November, 2006. Corresponding hydrographic data are given in Figure 5b. Depth contours are in meters.

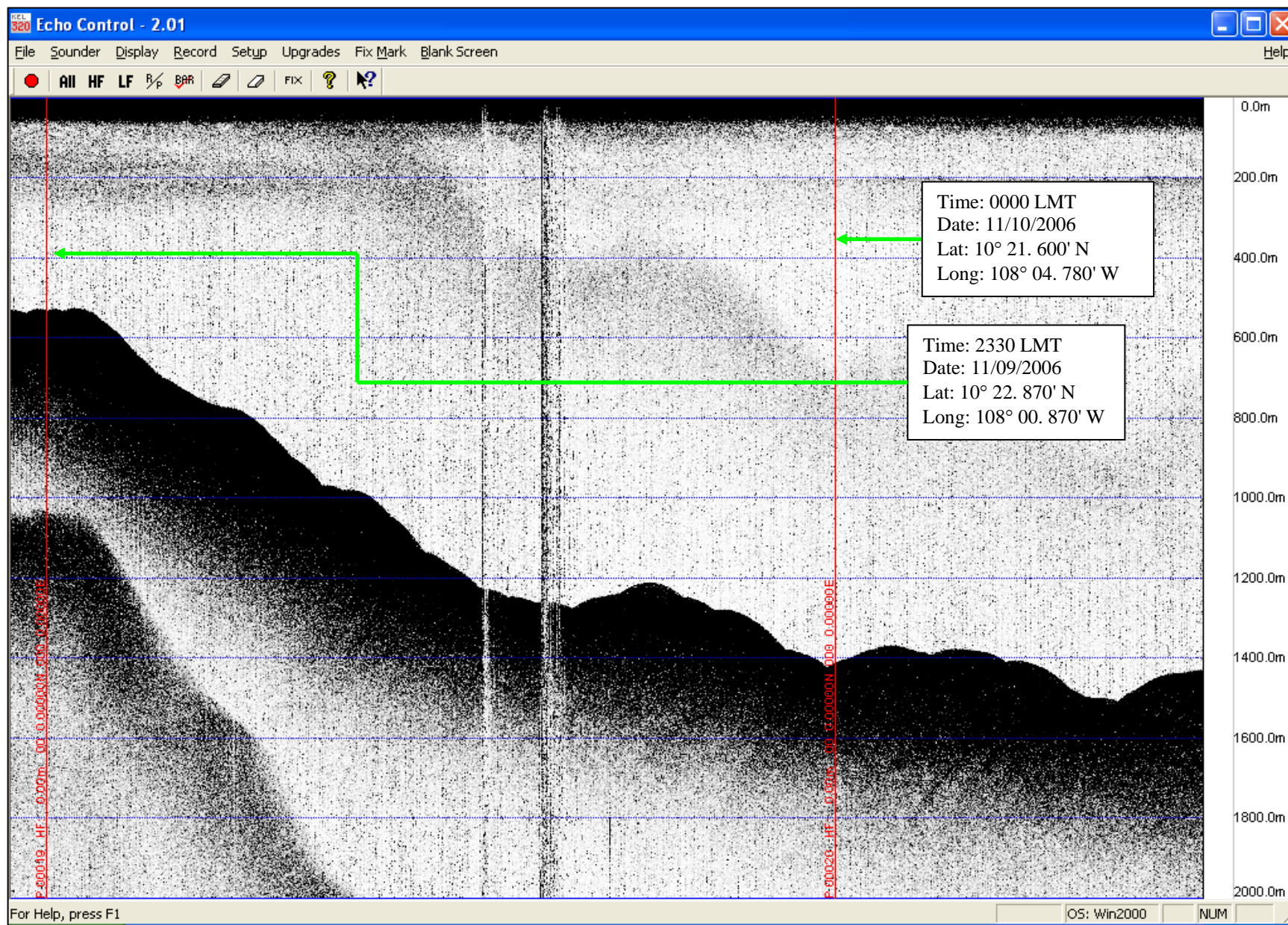


Figure 5b: Bathymetric profile corresponding to ship's location in Figure 5a.

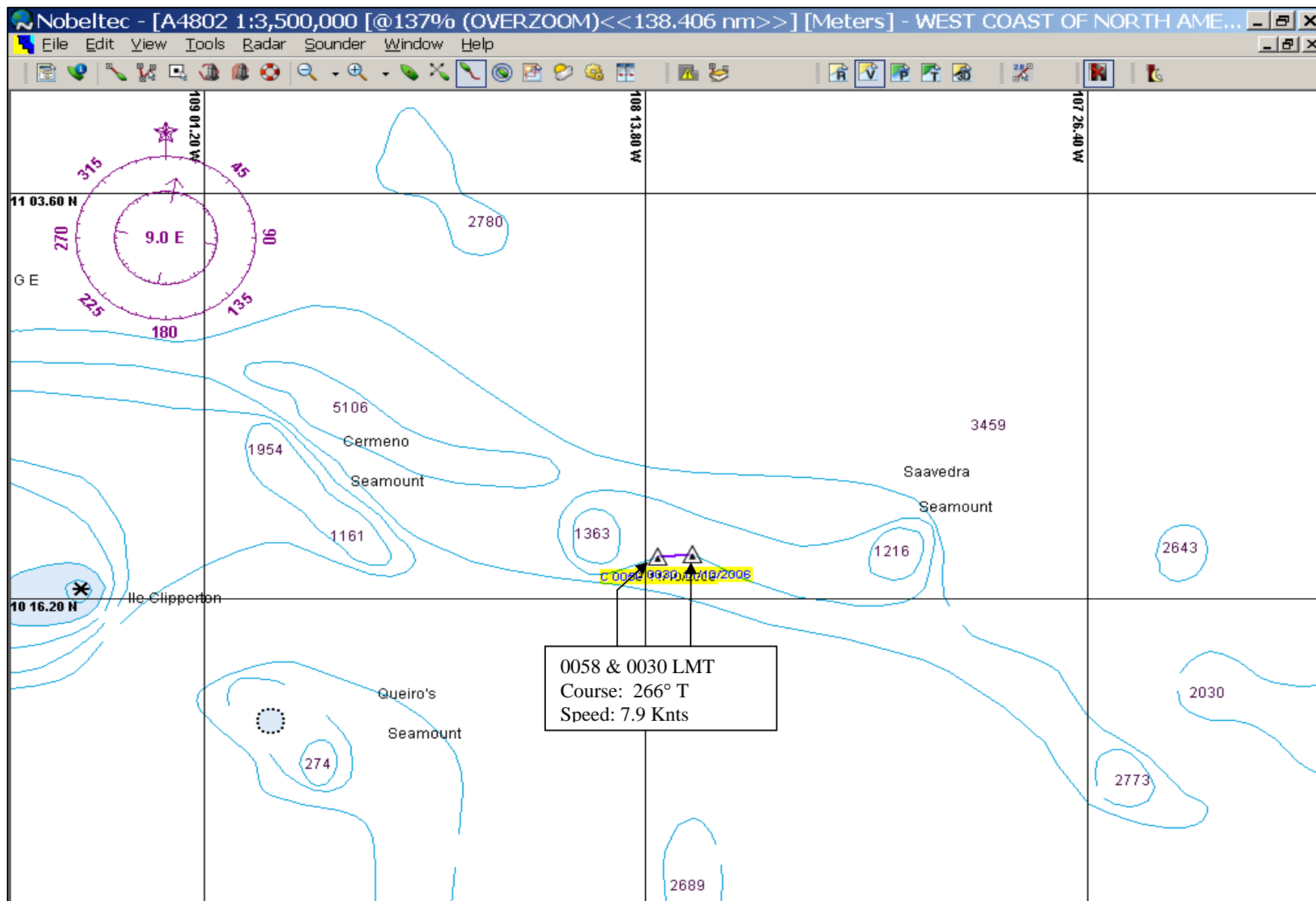


Figure 6a: Ship's position at 00:30 and 00:58 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 6b. Depth contours are in meters.

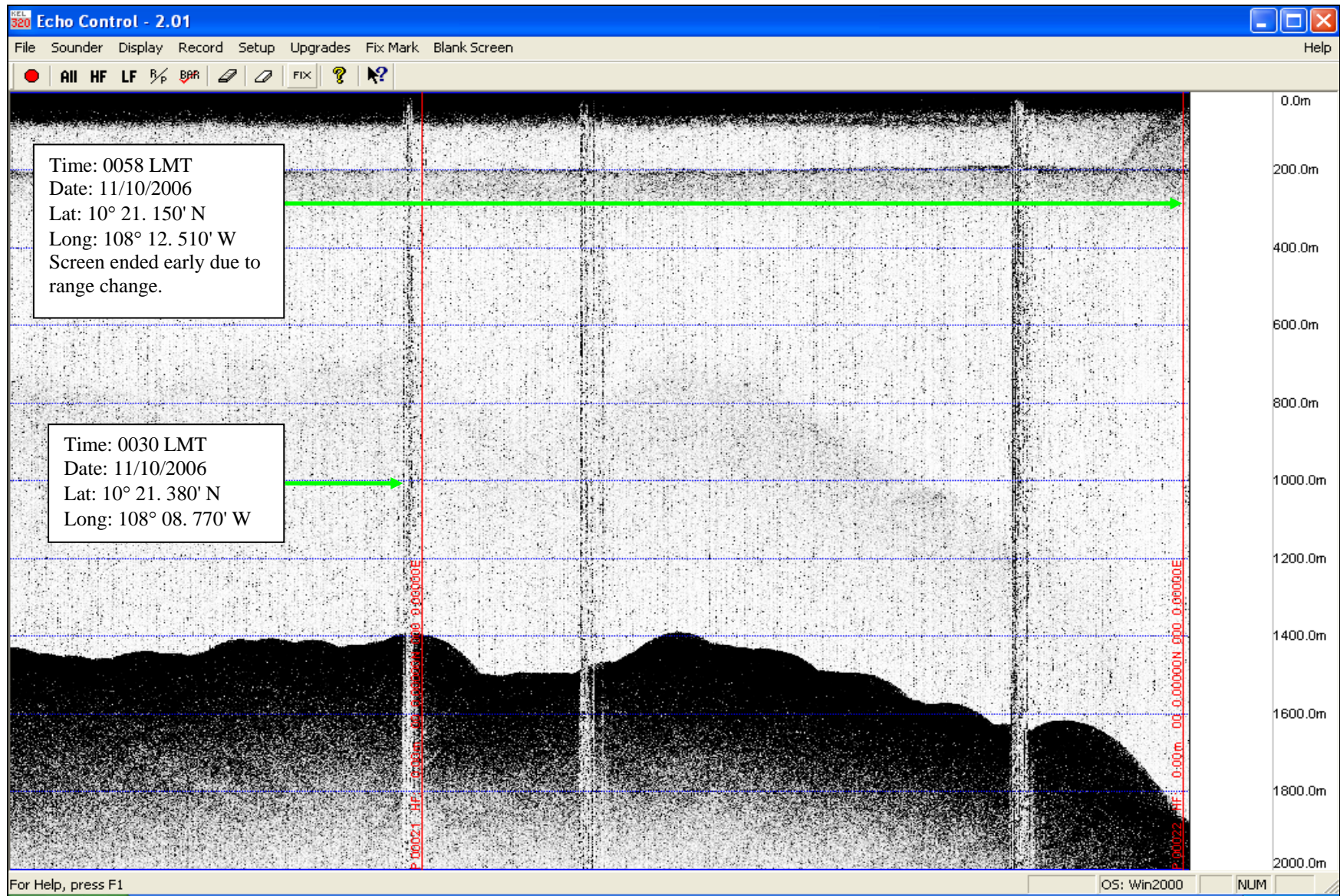


Figure 6b: Bathymetric profile corresponding to ship's location in Figure 6a.

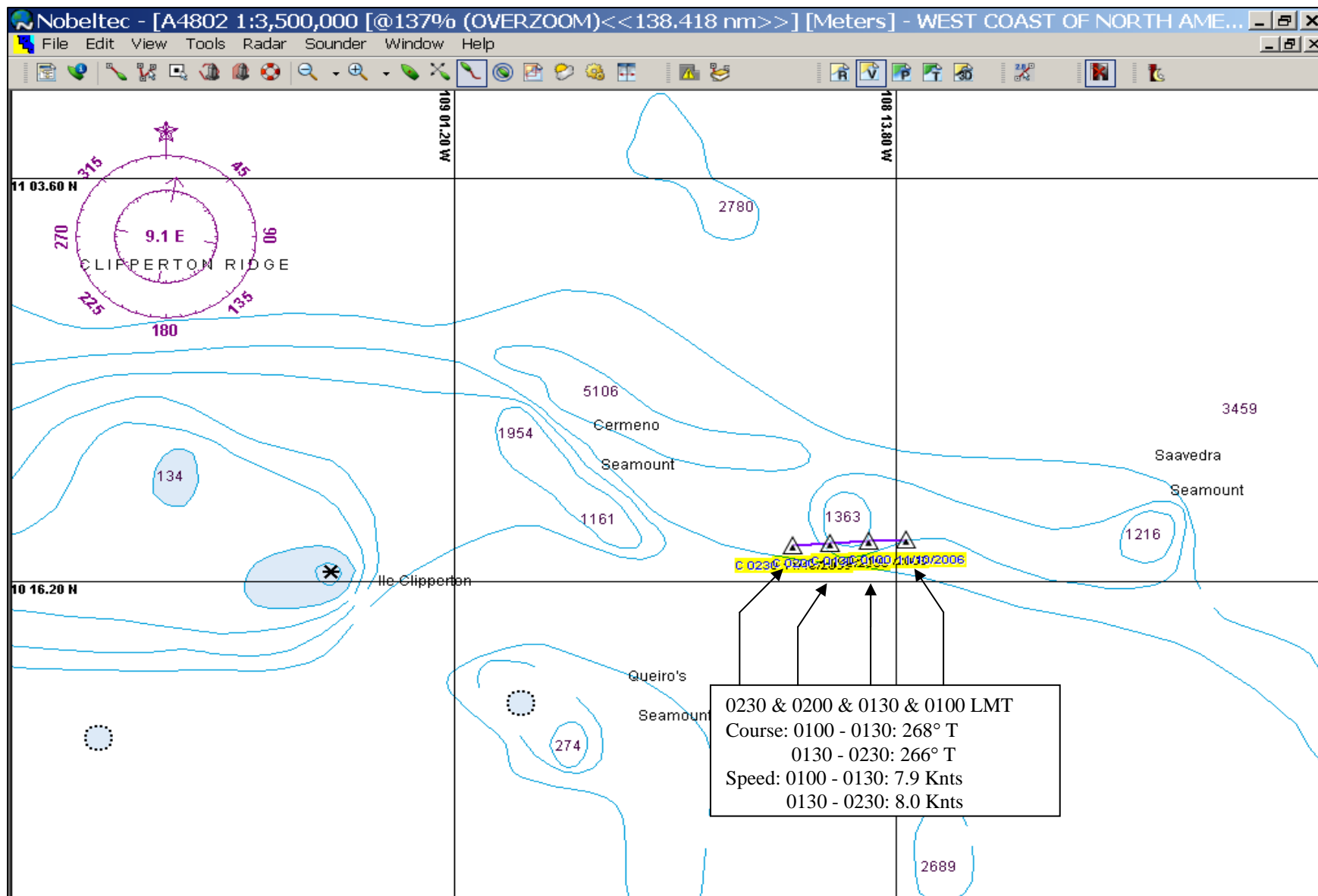


Figure 7a: Ship's position at 01:00, 01:30, 02:00 and 02:30 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 7b. Depth contours are in meters.

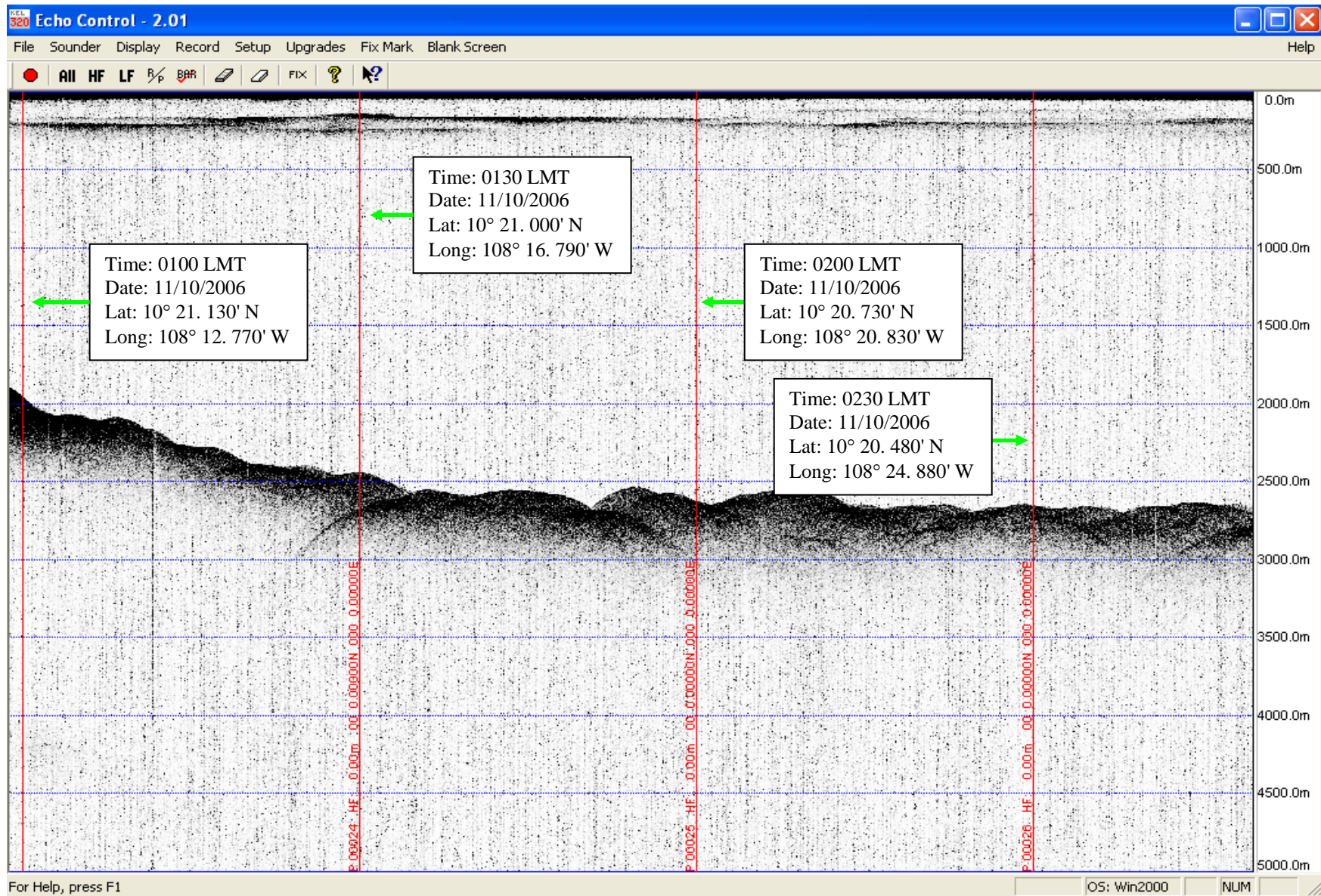


Figure 7b: Bathymetric profile corresponding to ship's location in Figure 7a.

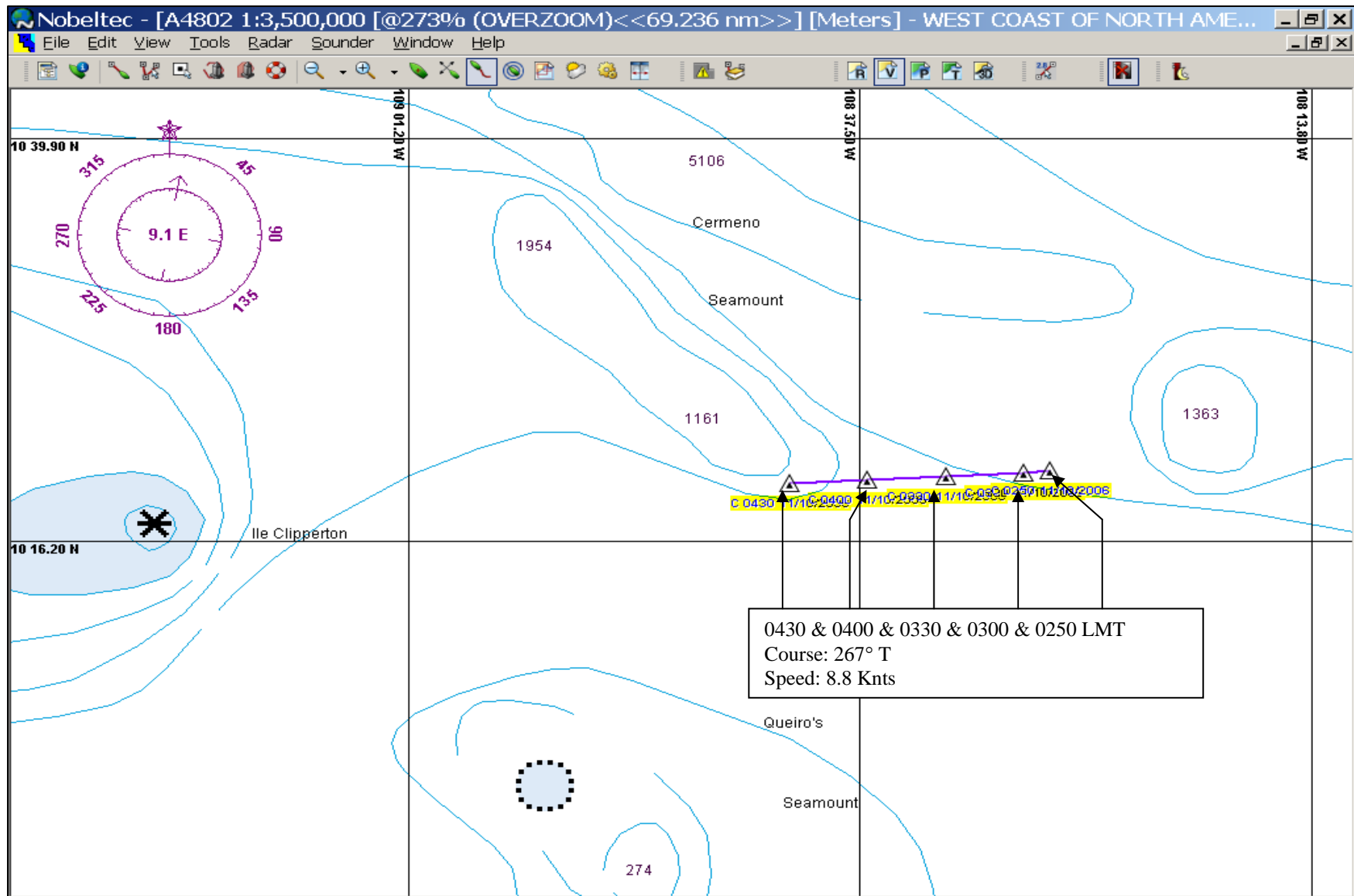


Figure 8a: Ship's position at 02:50, 03:00, 03:30, 04:00 and 04:30 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 8b. Depth contours are in meters.

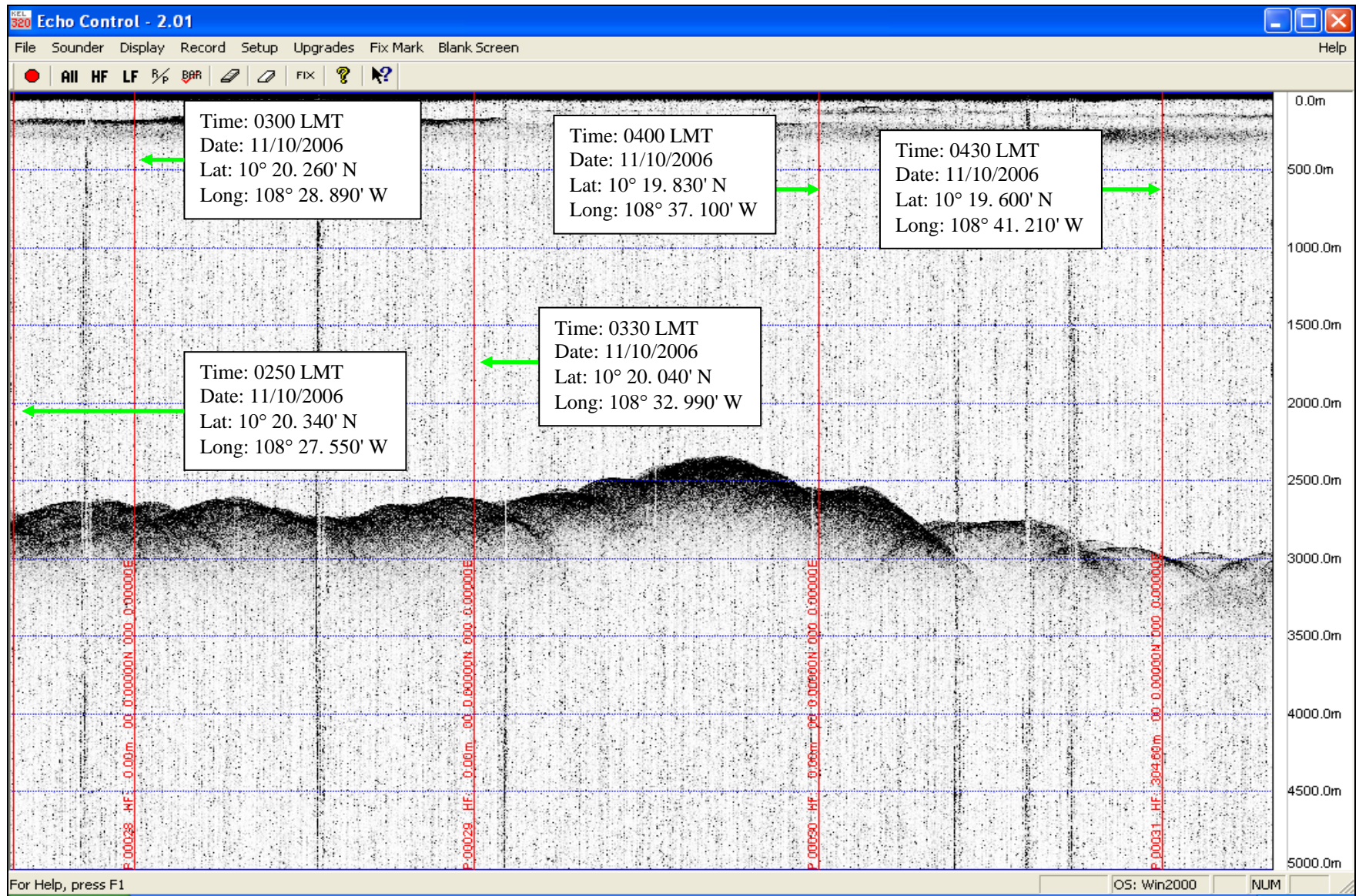


Figure 8b: Bathymetric profile corresponding to ship's location in Figure 8a.

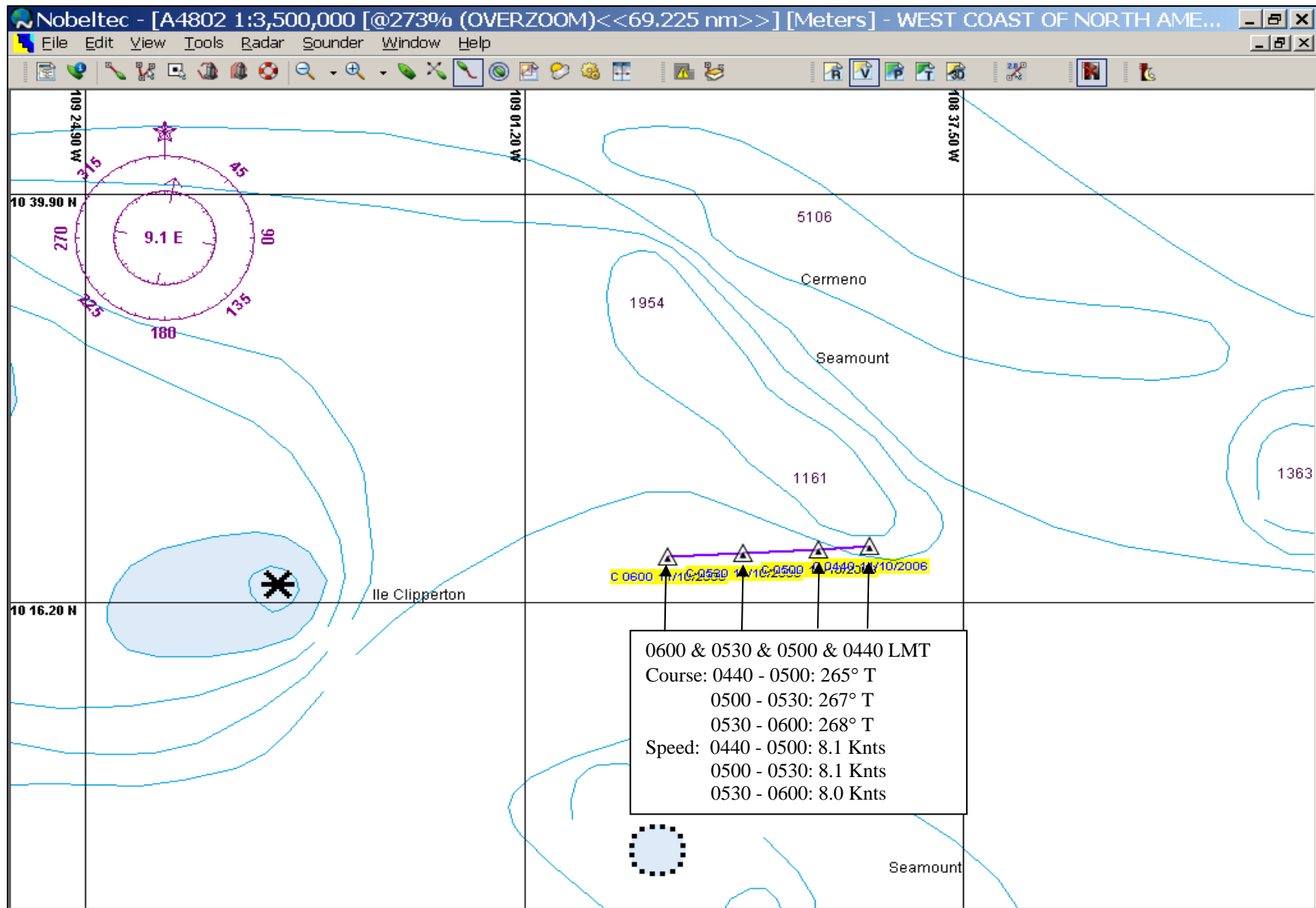


Figure 9a: Ship's position at 04:40, 05:00, 05:30 and 06:00 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 9b. Depth contours are in meters.

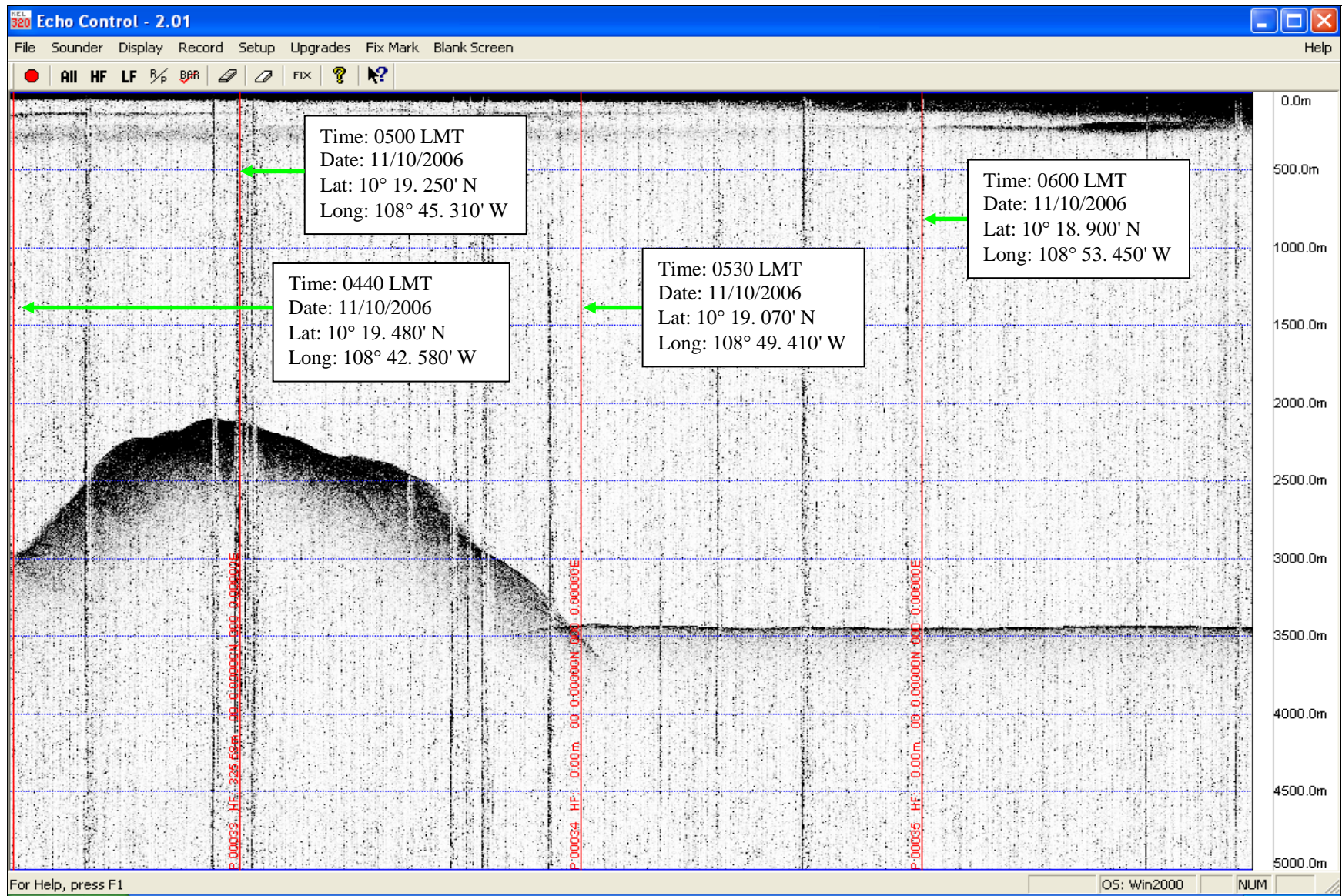


Figure 9b: Bathymetric profile corresponding to ship's location in Figure 9a.

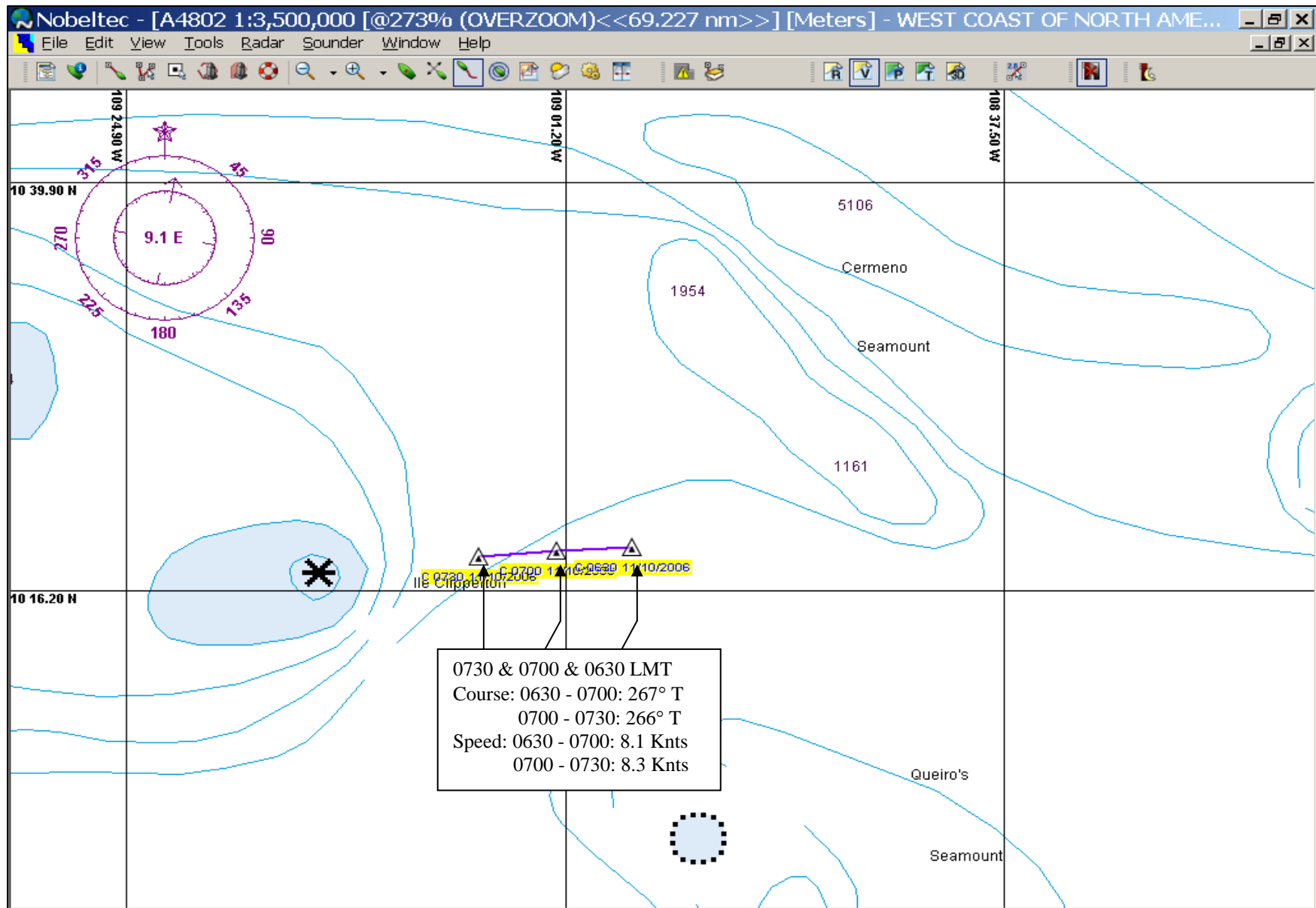


Figure 10a: Ship's position at 06:30, 07:00 and 07:30 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 10b. Depth contours are in meters.

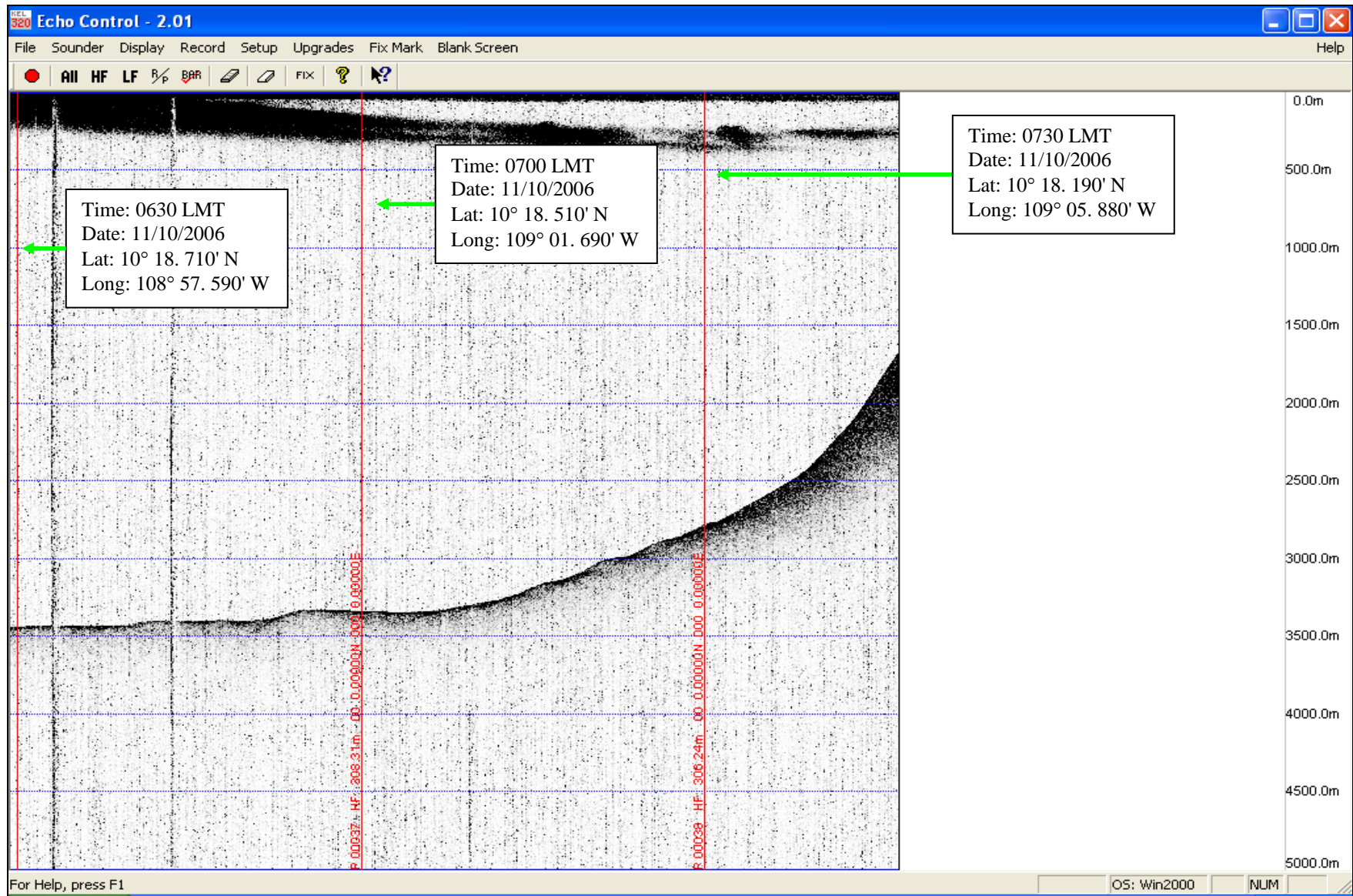


Figure 10b: Bathymetric profile corresponding to ship's location in Figure 10a.

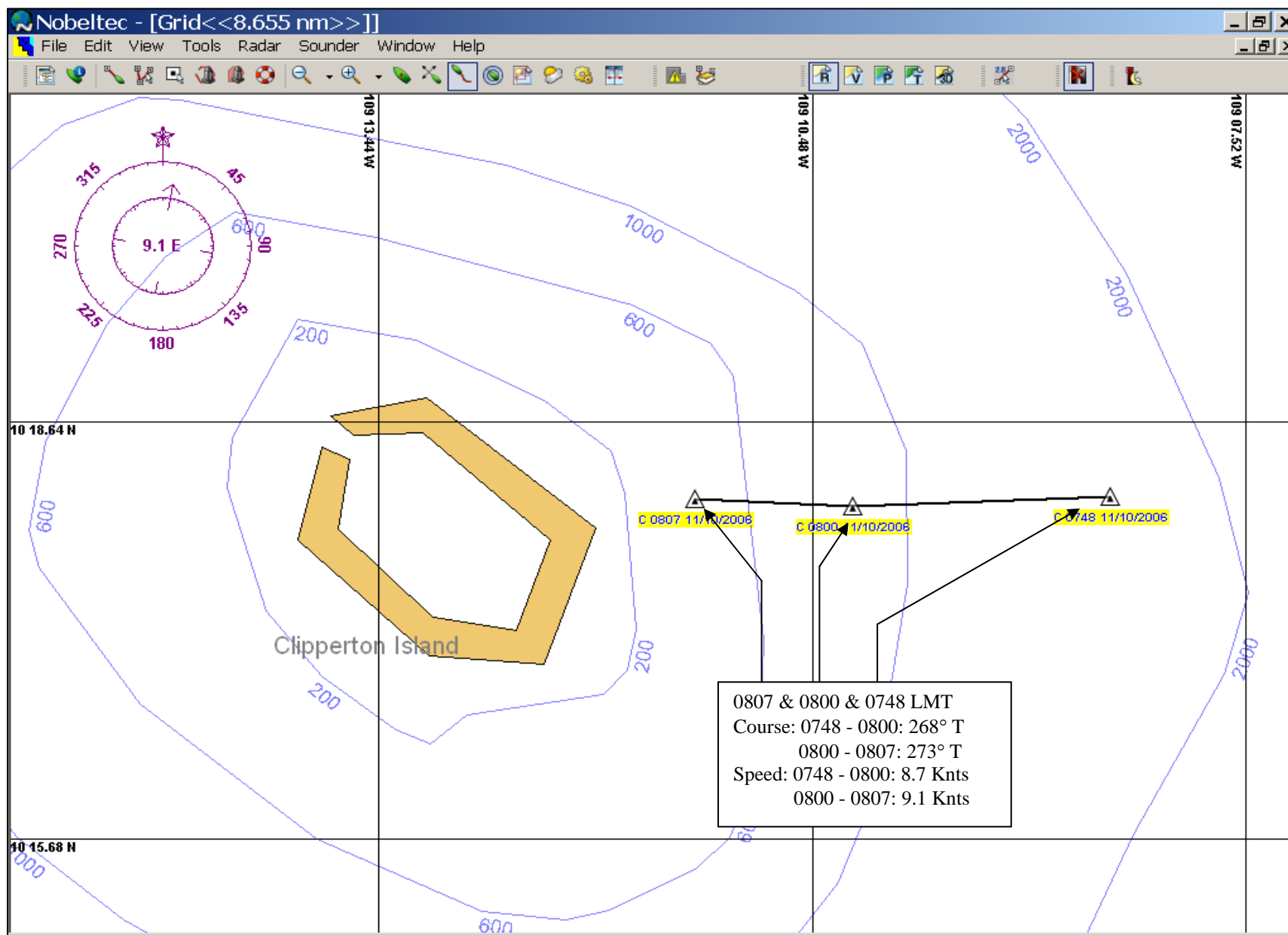


Figure 11a: Ship's position at 07:48, 08:00 and 08:07 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 11b. Depth contours are in meters.

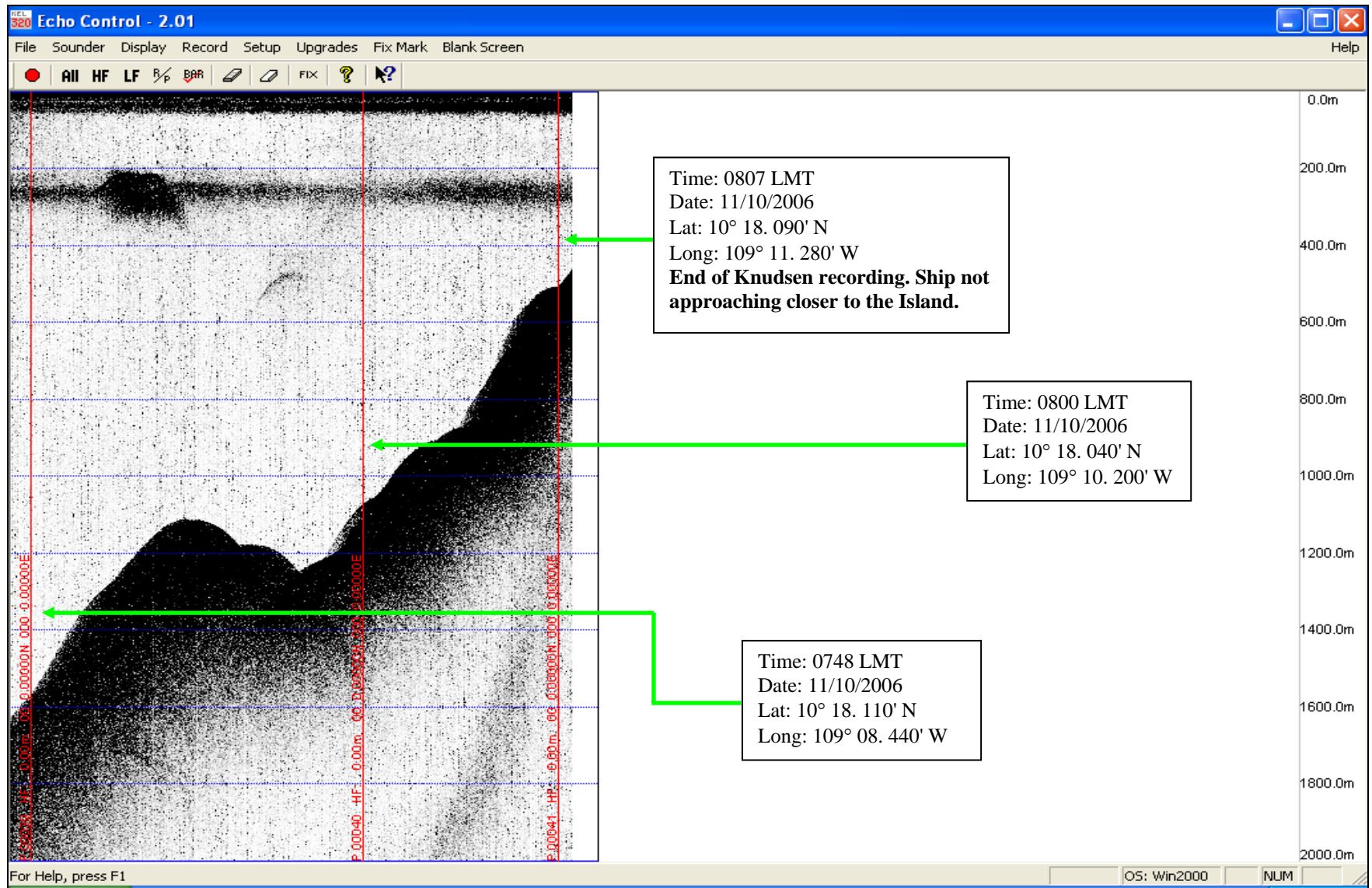


Figure 11b: Bathymetric profile corresponding to ship's location in Figure 11a.

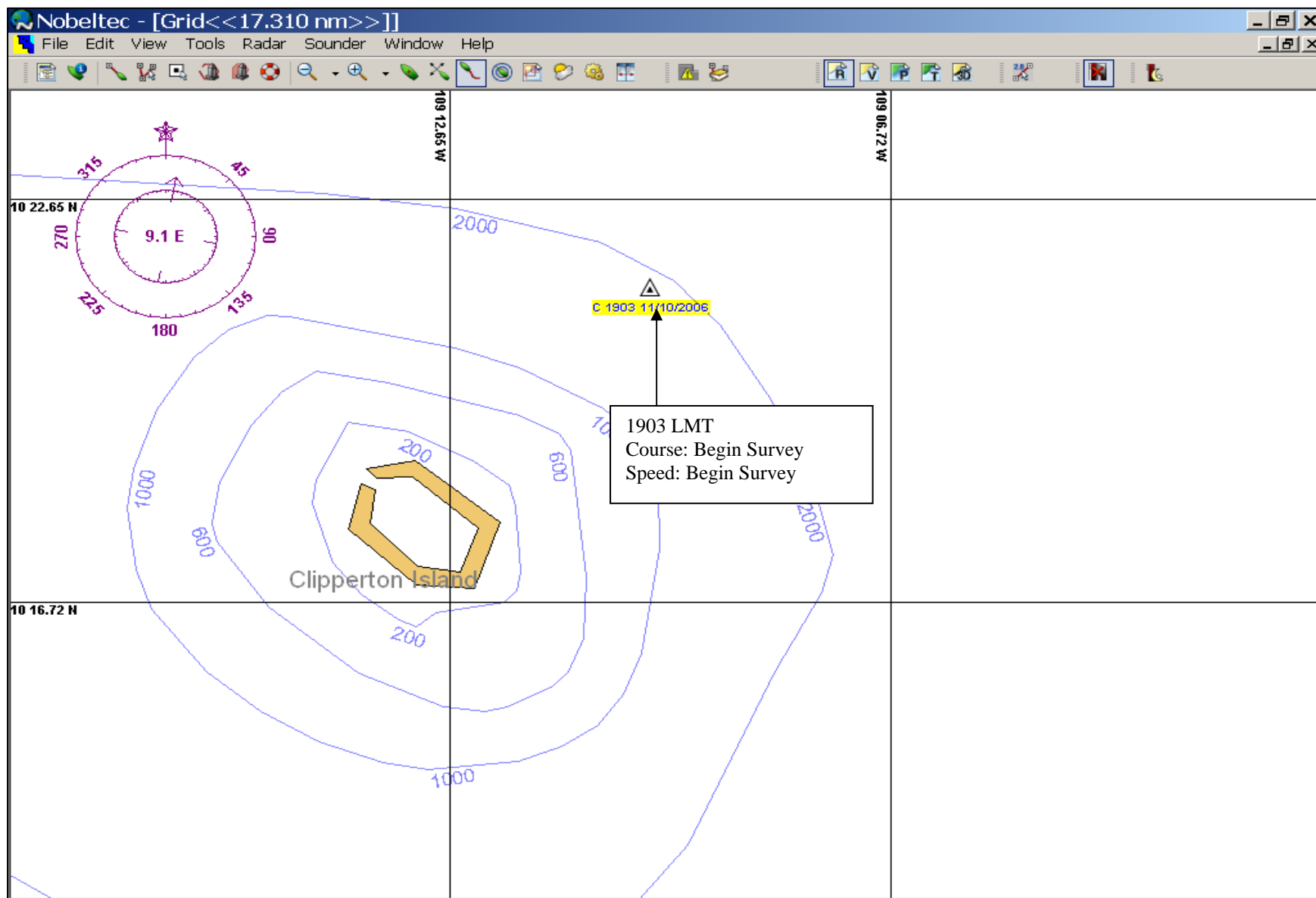


Figure 12a: Ship's position at 19:03 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 12b. Depth contours are in meters.

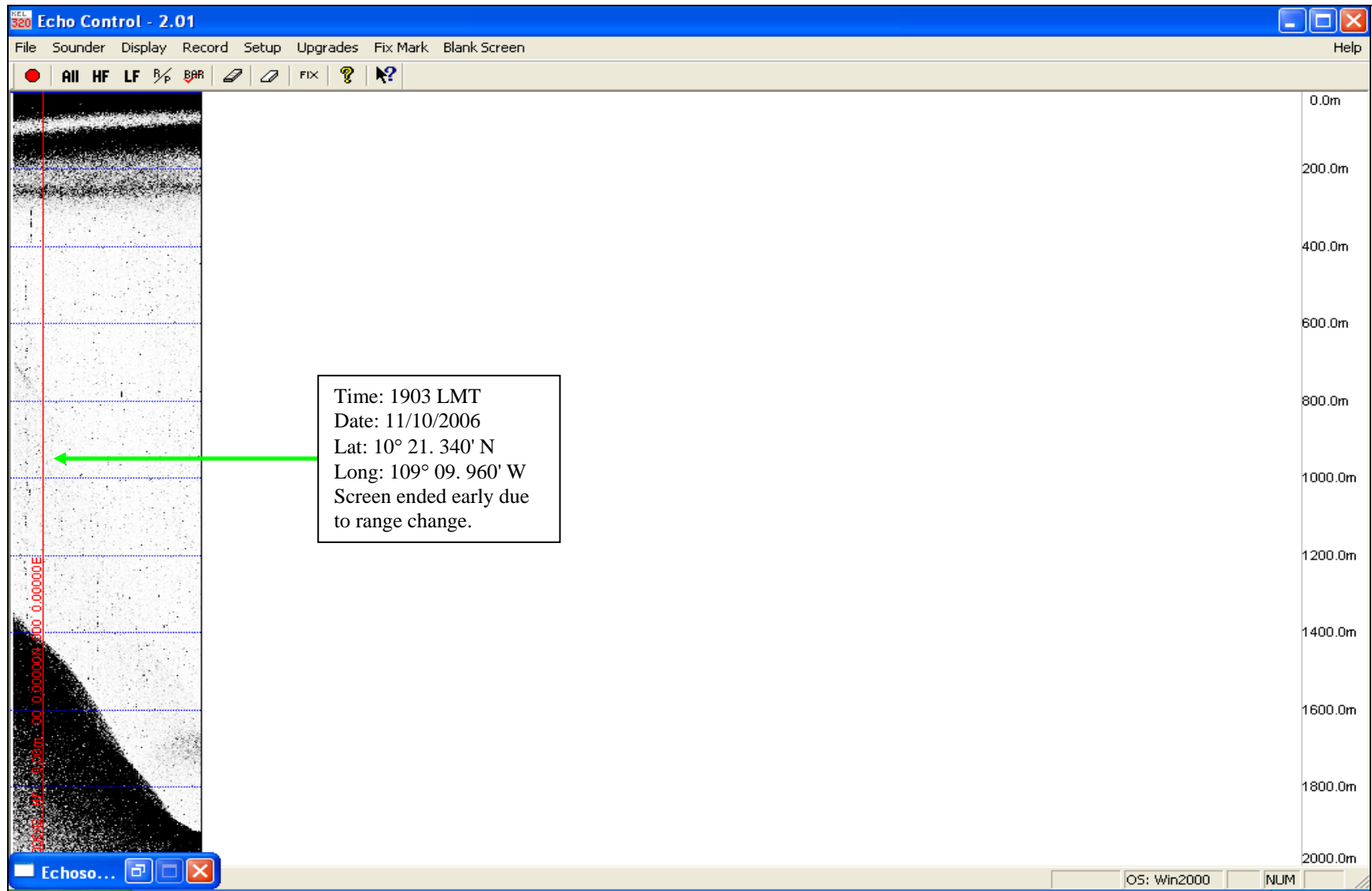


Figure 12b: Bathymetric profile corresponding to ship's location in Figure 12a.

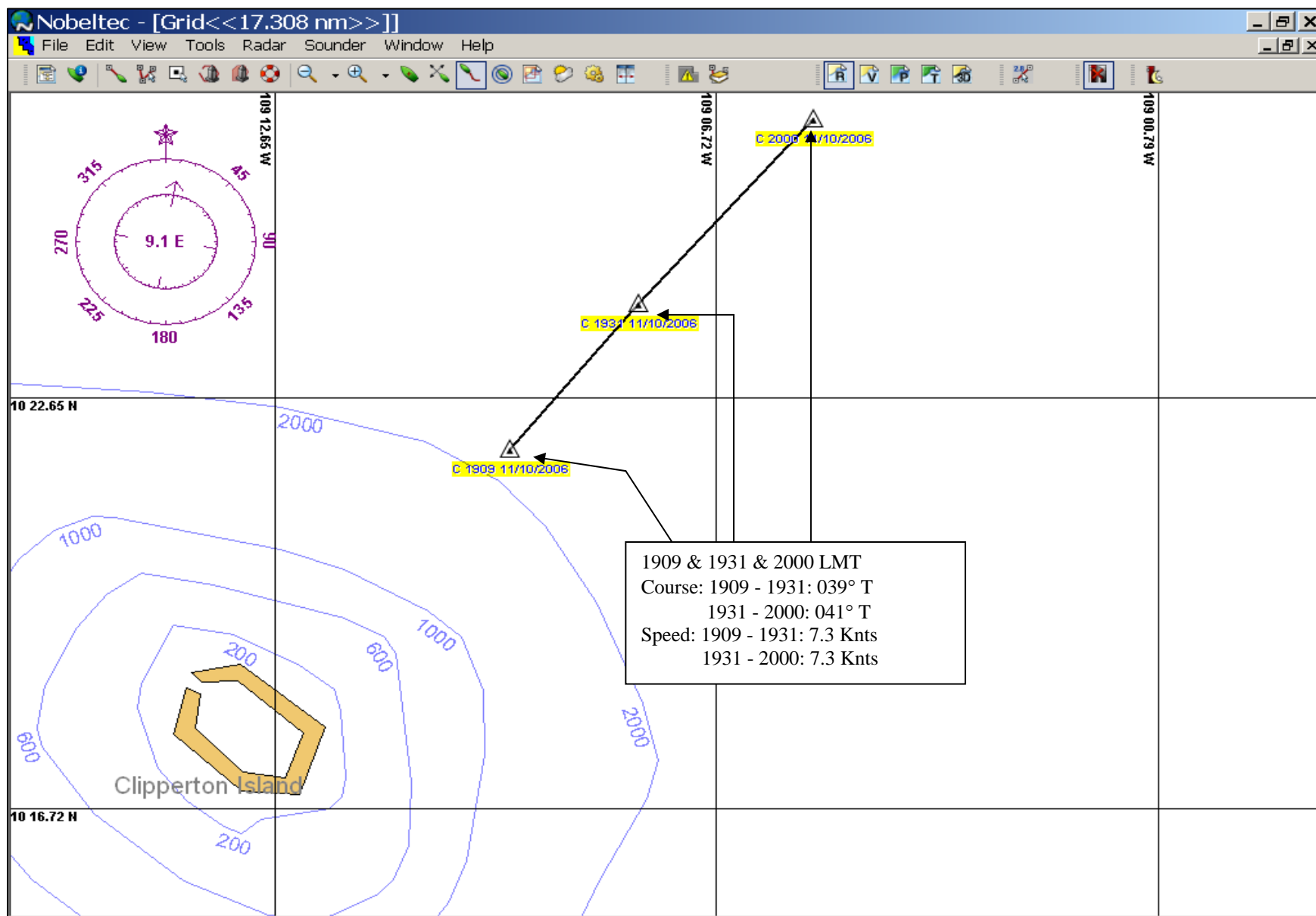


Figure 13a: Ship's position at 19:09, 19:31 and 20:00 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 13b. Depth contours are in meters.

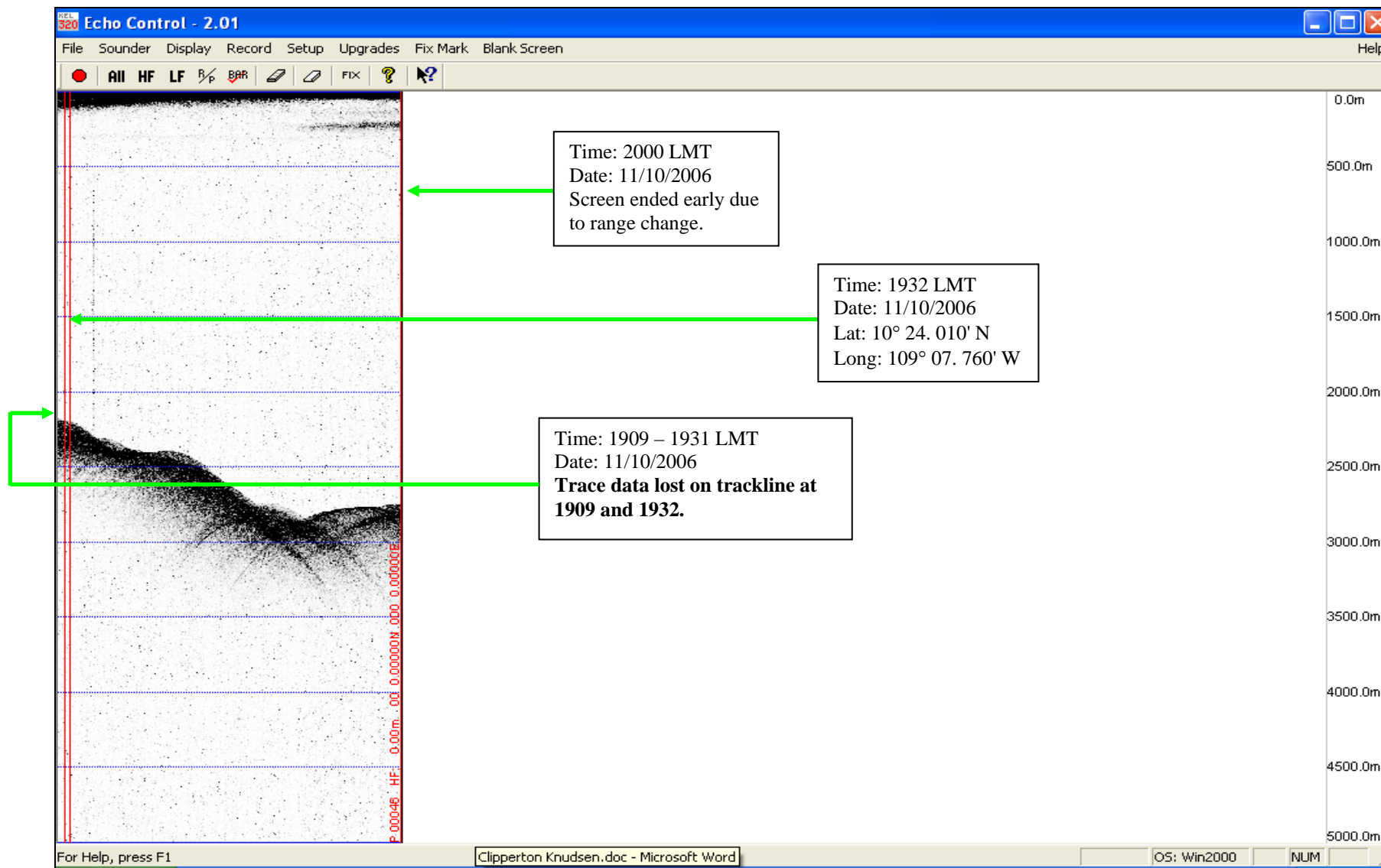


Figure 13b: Bathymetric profile corresponding to ship's location in Figure 13a.

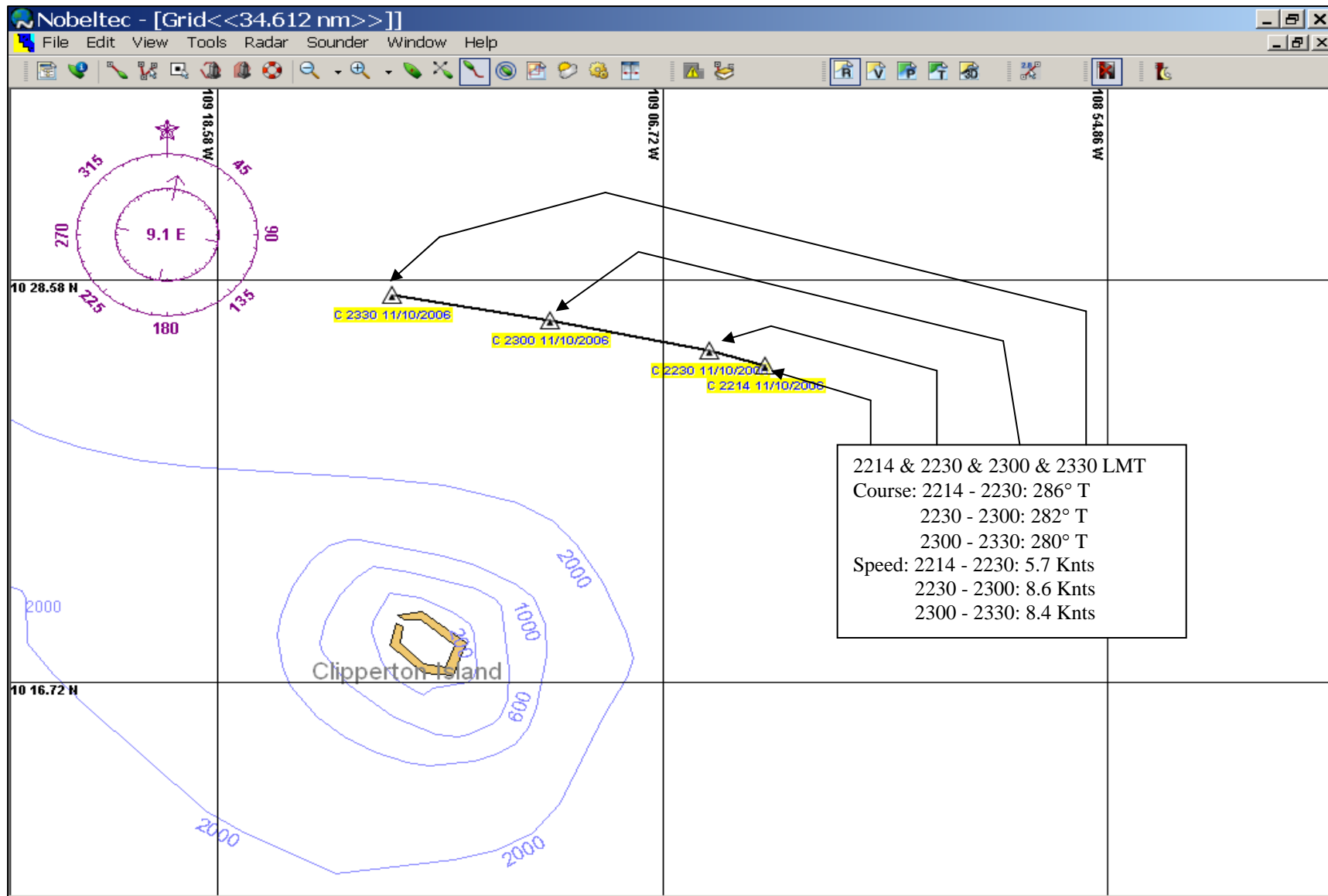


Figure 14a: Ship's position at 22:14, 22:30, 23:00 and 23:30 LMT on 10 November, 2006. Corresponding hydrographic data are given in Figure 14b. Depth contours are in meters.

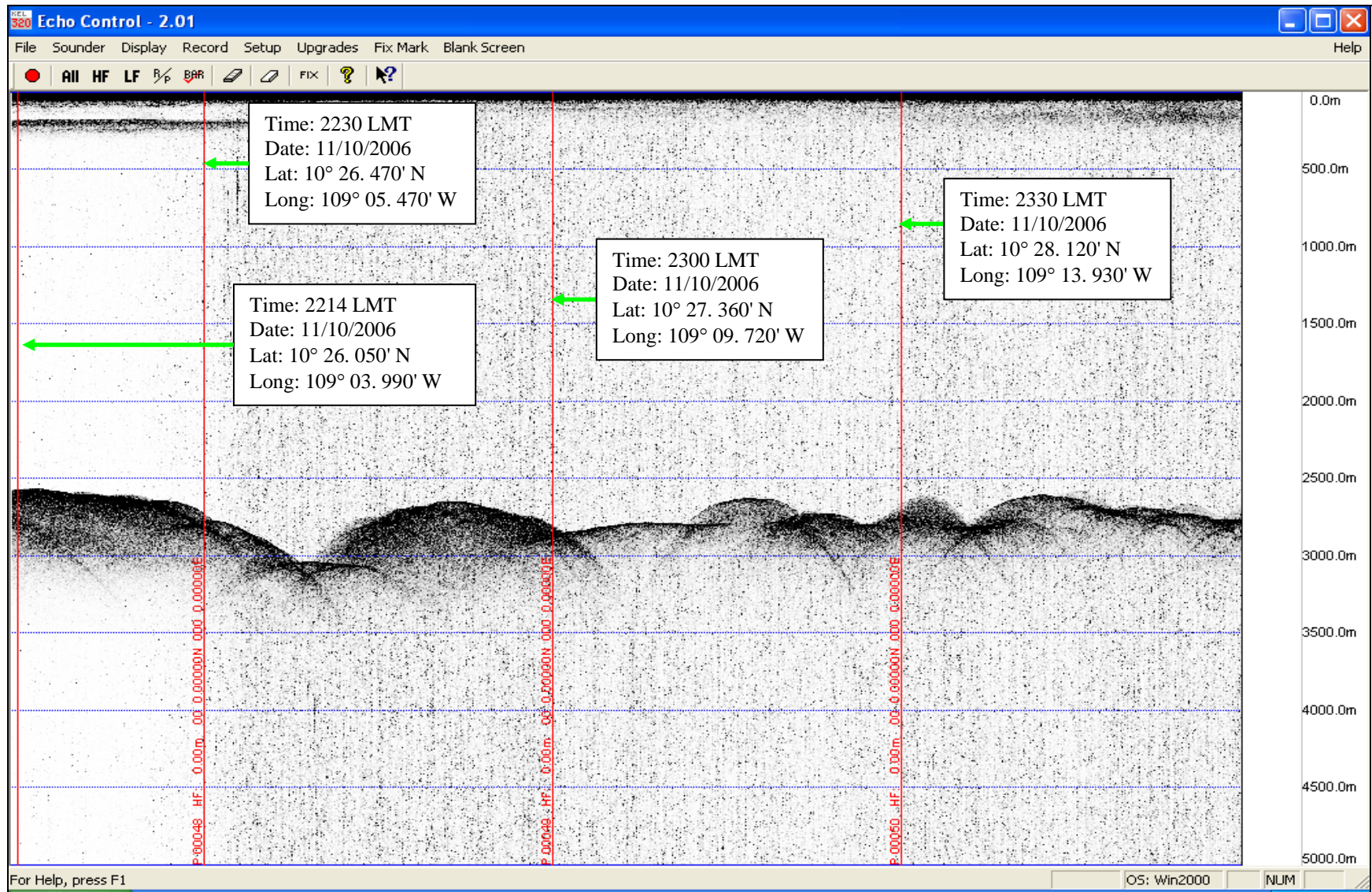


Figure 14b: Bathymetric profile corresponding to ship's location in Figure 14a.

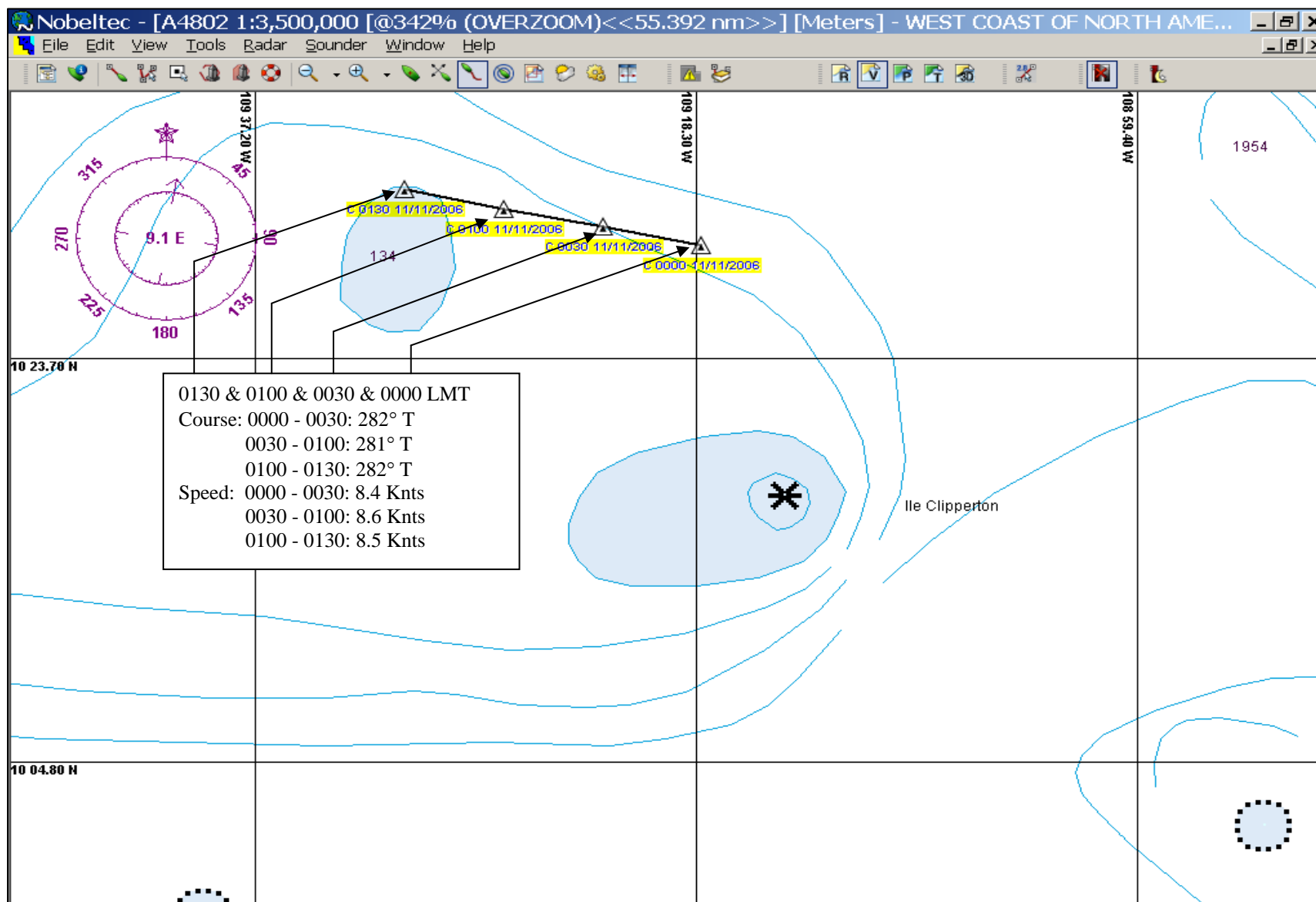


Figure 15a: Ship's position at 00:00, 00:30, 01:00 and 01:30 LMT on 11 November, 2006. Corresponding hydrographic data are given in Figure 15b. Depth contours are in meters.

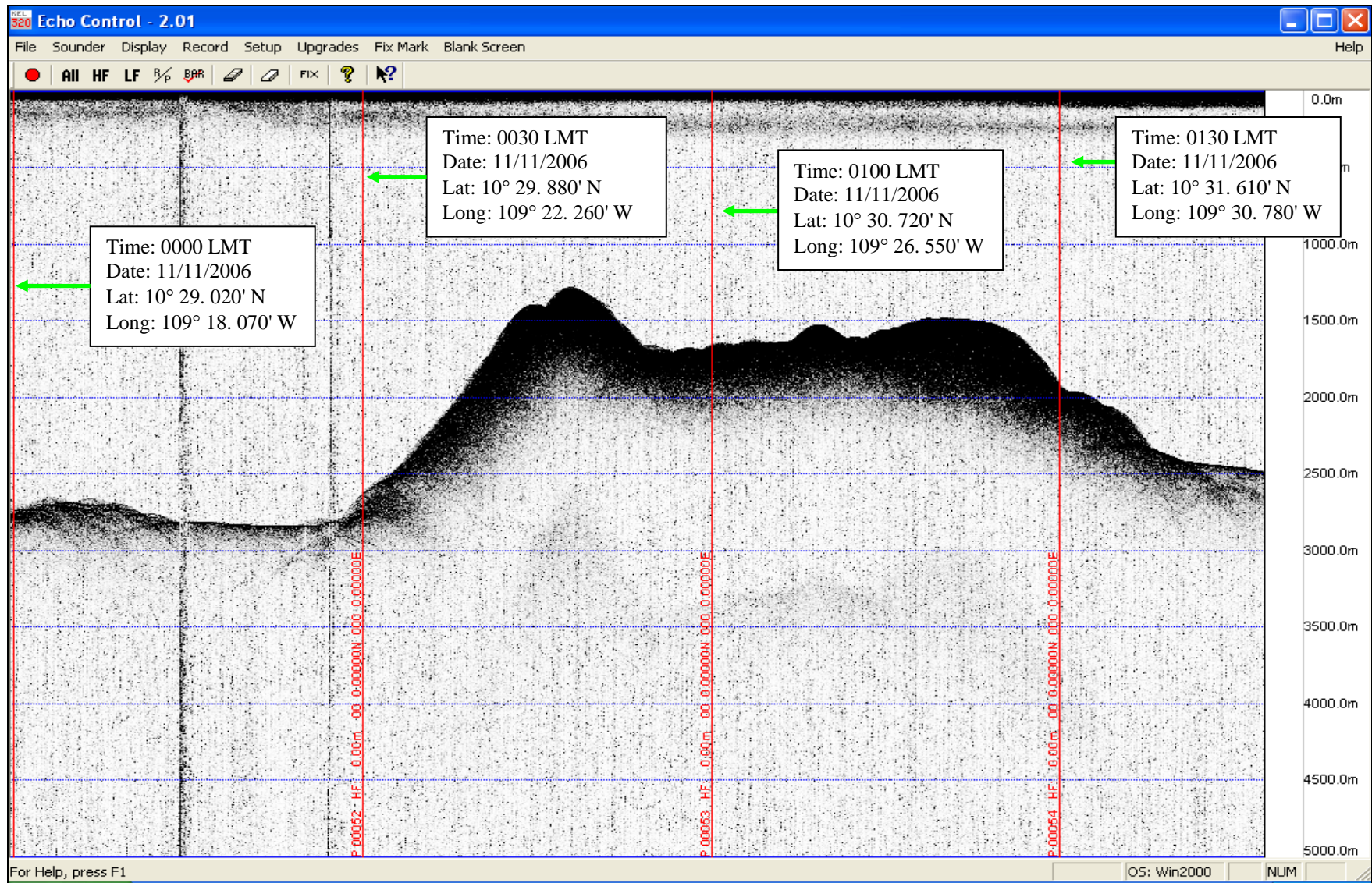


Figure 15b: Bathymetric profile corresponding to ship's location in Figure 15a.

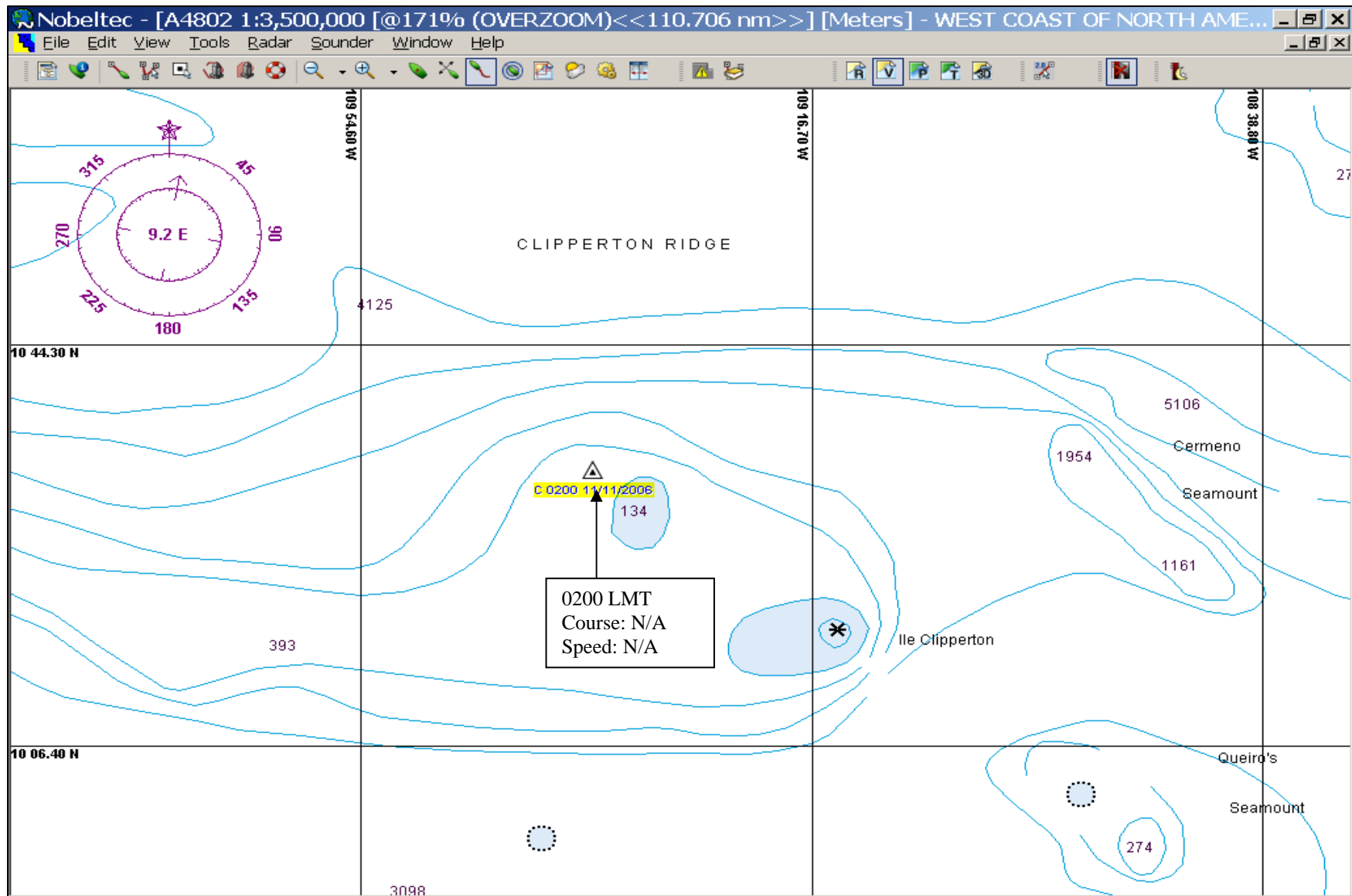


Figure 16a: Ship's position at 02:00 LMT on 11 November, 2006. Survey ended at 02:02 LMT on 11 November, 2006. Corresponding hydrographic data are given in Figure 16b. Depth contours are in meters.

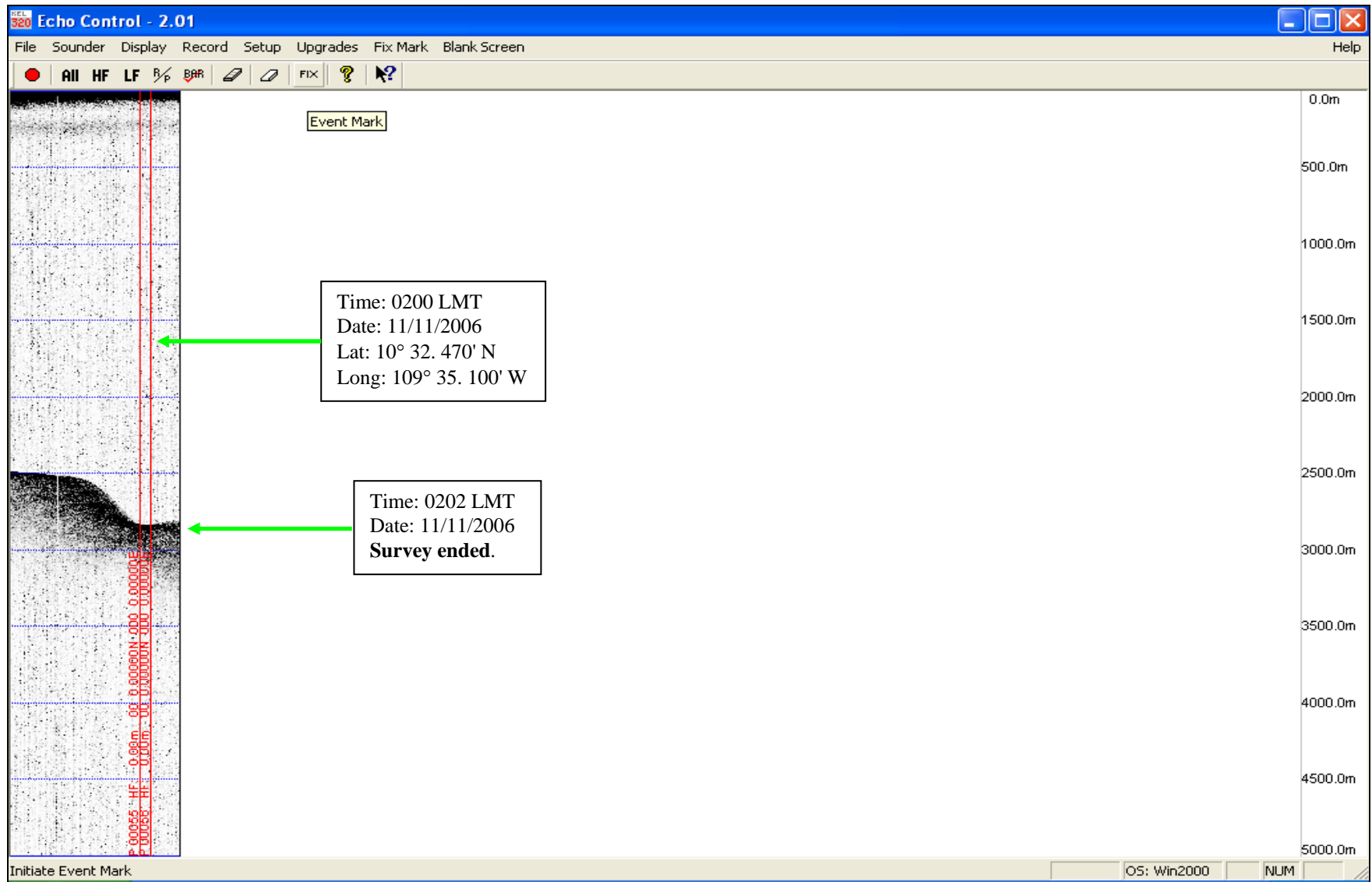


Figure 16b: Bathymetric profile corresponding to ship's location in Figure 16a.

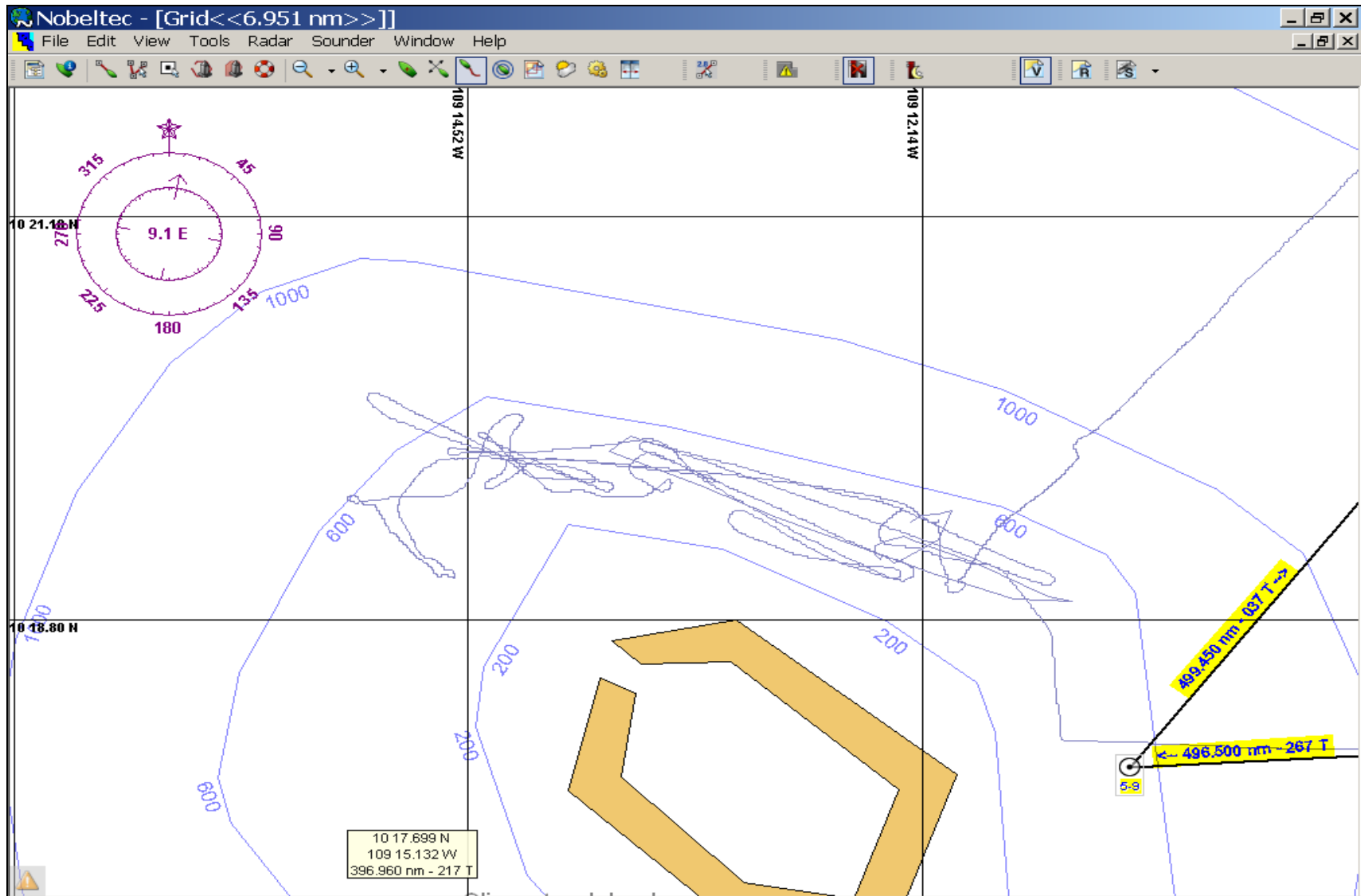


Figure 17: Trackline of NOAA Research Vessel David Starr Jordan (in blue) while transiting along the north side of Clipperton Atoll. Data are only available in EK500 Echoview format for this time period.

Table 1: Position of the NOAA Research Vessel DAVID STARR JORDAN during the transit along the Clipperton Ridge. Time is Local Mean Time; Latitude and Longitude are degrees and decimal minutes north and west, respectively.

| Date | Time (z=L+6) | Lat | Long |
|--------|-----------------|-----------|------------|
| 9-Nov | 2045 | 10 23.030 | 107 38.790 |
| 9-Nov | 2130 | 10 22.670 | 107 44.840 |
| 9-Nov | 2200 | 10 22.320 | 107 48.920 |
| 9-Nov | 2230 | 10 22.150 | 107 52.900 |
| 9-Nov | 2242 | 10 22.130 | 107 54.510 |
| 9-Nov | 2300 | 10 22.090 | 107 56.930 |
| 9-Nov | 2313 | 10 22.030 | 107 58.650 |
| 9-Nov | 2328 | 10 21.900 | 108 00.610 |
| 9-Nov | 2330 | 10 21.870 | 108 00.870 |
| 10-Nov | 0000 | 10 21.600 | 108 04.780 |
| 10-Nov | 0030 | 10 21.380 | 108 08.770 |
| 10-Nov | 0058 | 10 21.150 | 108 12.510 |
| 10-Nov | 0100 | 10 21.130 | 108 12.770 |
| 10-Nov | 0130 | 10 21.000 | 108 16.790 |
| 10-Nov | 0200 | 10 20.730 | 108 20.830 |
| 10-Nov | 0230 | 10 20.480 | 108 24.880 |
| 10-Nov | 0250 | 10 20.340 | 108 27.550 |
| 10-Nov | 0300 | 10 20.260 | 108 28.890 |
| 10-Nov | 0330 | 10 20.040 | 108 32.990 |
| 10-Nov | 0400 | 10 19.600 | 108 41.210 |
| 10-Nov | 0440 | 10 19.480 | 108 42.580 |
| 10-Nov | 0500 | 10 19.250 | 108 45.310 |
| 10-Nov | 0530 | 10 19.070 | 108 49.410 |
| 10-Nov | 0600 | 10 18.900 | 108 53.450 |
| 10-Nov | 0630 | 10 18.710 | 108 57.590 |
| 10-Nov | 0700 | 10 18.510 | 109 01.690 |
| 10-Nov | 0730 | 10 18.190 | 109 05.880 |
| 10-Nov | 0748 | 10 18.110 | 109 08.440 |
| 10-Nov | 0800 | 10 18.040 | 109 10.200 |
| 10-Nov | 0807 | 10 18.090 | 109 11.280 |
| 10-Nov | 1903 | 10 21.340 | 109 09.960 |
| 10-Nov | 1909 | 10 21.910 | 109 09.480 |
| 10-Nov | 1931 | 10 24.010 | 109 07.760 |
| 10-Nov | 2000 | 10 26.670 | 109 05.420 |
| 10-Nov | 2214 | 10 26.050 | 109 03.990 |
| 10-Nov | 2230 | 10 26.470 | 109 05.470 |
| 10-Nov | 2300 | 10 27.360 | 109 09.720 |
| 10-Nov | 2330 | 10 28.120 | 109 13.930 |
| 11-Nov | 0000 | 10 29.020 | 109 18.070 |
| 11-Nov | 0030 | 10 29.880 | 109 22.260 |
| 11-Nov | 0100 | 10 30.720 | 109 26.550 |
| 11-Nov | 0130 | 10 31.610 | 109 30.780 |
| 11-Nov | 0200 | 10 32.470 | 109 35.100 |

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